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STANDARDS FOR DETERMINING THE SUITABILITY OF PATIENTS FOR ADMISSION TO A FREE DISPENSARY

BORDEN S. VEEDER, M.D.

ST. LOUIS

It is the purpose of this paper to discuss the results of a study of outpatient clinics, and it deals in particular with the standards adopted by the Washington University Dispensary for judging the financial suitability of applicants for admission.

THE PROBLEM

In December, 1914, three distinct outpatient clinics connected with the Washington University Medical School or its affiliated hospitals were merged into one dispensary, moved to a new location in a distant part of the city and the old clinics closed. Although a comprehensive system of records and administration was prepared in advance, a number of conditions arose requiring study and adjustment. Among the more complex of these was the question of the suitability of patients for admission. The old clinics were located in the poorer portion of the city and in part in what is now the negro segregation district, while the new clinic is in the residential district. A large number of the applicants for admission were old clinic patients who made the long trip to the new location, but it soon became apparent that a new clientele was coming from all parts of the city, greater in number than that of the three old clinics combined. For some time the question of the suitability of patients for admission was handled entirely by the social service department, but it soon developed that the functions of this department were being subverted to those of a detective bureau. At their request a committee was appointed to establish standards for the admission of patients to the dispensary. This committee consisted of Miss Julia Stimson, head social service worker, and Dr. G. Canby Robinson and myself from the dispensary committee of the medical school.

Our first work was to get into communication with a number of the larger clinics in the country to obtain their standards of admission. We inquired as to the grouping and classification of patients, what was considered financial suitability, what investigation of patients was made, and the attitude of outside physicians toward the clinic. The following abstracts are from some of the replies:

Philadelphia.—The doctors here have almost no interest in the matter. We practically are never asked to investigate cases. Patients are grouped into (1) refused (those able to afford a physician and who have not been to an outside physician previously); (2) consultation cases (those seen once for diagnosis and referred outside for treatment), and (3) regular cases. We reckon a family of five with $70 a month can pay a doctor for ordinary ailments. All investigations are made through the social service department, as otherwise there would be as many bases for decision as there were doctors.

Baltimore.—I do not see how it would be practicable to adopt a table of income, which would be the basis on which one would determine that a patient is financially unsuitable for treatment in the dispensary. Most of the patients admitted to the hospital wards are first examined in the dispensary. In this clinic there are no "standards," nor is there any attempt at financial investigation.

Cleveland.—Cases are grouped as to whether suitable for all conditions (A) or for special work, etc. This clinic would admit a working man with a family of five children in "A" (all conditions) if daily wage is $1.75 ($49 per month) or less, or into "C" (needs great or special) if he received from $2 to $2.25 per day (from $56 to $63 per month). The figure based on economic and sociological studies should be the ruling figure in all communities, but it is not and will not be until the old question of dispensary abuse and opposition to dispensaries by local physicians is done away with.

Boston.—We have not reduced our policy to writing. In practice our working standard has been that an income of approximately $1,000 a year seemed to us necessary before a family of four or five persons should be expected to pay for medical service. . . . The patient is then interrogated by our admitting physician, who makes up his mind the best he can, but without any definite financial standard, whether the patient can pay or not. In my opinion this financial investigation, so-called, is worthless.

These are representative of the replies received. They make certain things clear. First, there are no definite or established standards in use on which to judge of the suitability of dispensary applicants. Secondly, there is no attempt by the majority of clinics to classify patients except by disease. Third, the question of financial suitability and investigation, while admittedly an important factor, has been worked out largely in a haphazard way, and all figures used are purely arbitrary. These figures vary all the way from $50 to $100 a month for a normal family, and obviously both cannot be correct as there is not a 100 per cent. difference in the cost of living between any two of our cities. The committee thus found that the methods and standards of other clinics were of questionable value, and a study of the entire question was undertaken.

TYPES OF CLINICS AND THEIR DEVELOPMENT

In order fully to grasp the subject of the medical dispensary, or clinic, it is essential to have a clear conception of its origin, growth and development, as its present day problems are to a large extent the result of changing social, economic and medical conditions.

There are two more or less distinct purposes for which dispensaries have been developed: (1) as a means of collecting material for the teaching of clinical medicine, and (2) as a means of furnishing free treatment to the indigent poor who for social or economic reasons are unable to pay for the services of a physician. As a rule, these clinics are connected with hospitals, but a few are independent or municipal.

The first group, teaching clinics, are rapidly diminishing in number, hand in hand with the decrease in the number of medical schools. Some, like the Washington University Dispensary, are maintained by schools and are independent of hospitals, while others are clinics of the second type with which the medical school has some form of connection. To a very large extent these clinics are charity clinics, and hence what is said below applies to them. Theoretically, there is the possibility of these clinics attracting persons not absolutely worthy objects of charity because of the prominence of the institution or of certain members of the staff. As a matter of fact, experience has shown that the objection to being used as material for teaching actually drives away a great many patients who are worthy of free treatment. This has become so marked a feature in some teaching clinics that there has been insufficient material for the purposes of instruction. The necessity of material for the instruction of medical students is so obvious that there can be no question as to the right or propriety of any legitimate medical school conducting a dispensary, provided it has a fixed rule that any patient refusing to act as material for purposes of instruction is refused admission. Should a teaching clinic lack material for purposes of instruction, it might with propriety lower its standards for admission, as it is not a purely philanthropic institution and the end in view justifies the purposes for which this is done. It is hardly consistent for a physician who has enjoyed the benefits of a thorough medical education (the average cost of instruction for the four years being around $3,000 and the tuition charges from $600 to $800) to object to a clinic connected with a medical school on the ground that the clinic lessens the financial returns from private practice.

By far the larger proportion of outpatient clinics have been developed with the idea in view of caring for individuals who are unable to pay for competent medical advice and treatment. It is not my purpose to discuss the various causes or aspects of poverty except to call to mind that ill health, in itself, is one of the most common causes of improvidence, and hence of inability to pay for the medical attention necessary in order that the patient may be restored to health. To a very large extent the development of poverty in this country has gone hand in hand with the gradual change from a rural to an urban population and the massing together of people in the cities. In the rural districts or small cities the poor form a relatively small percentage and are not segregated. Under these circumstances the question of medical service for the poor has been settled by having each individual physician assume a certain share of the free work in the community without allowing this to become an overwhelming burden. As the cities have grown with the drift of the population to industrial centers, the relative number of dependents has increased, and, what is more important, they have collected in certain quarters or districts. The physicians in these districts would be overwhelmed by charity work if they had to assume the entire burden. If many of these sick poor were forced to pay for medical treatment they would in turn be forced to a condition of living which would in itself tend to aggravate the physical condition. Recent "health surveys" have shown that even in cities with free clinics a large percentage of the sick are without the services of a physician. This is the underlying factor in the development of medical dispensaries, that is, they are an attempt to meet the results of economic conditions.

The system is in itself inherently wrong, for often persons are forced by it to accept private charity for what in reality is a condition for which society as a whole is to a large extent responsible and which should be a burden of the state. It should not be necessary for a few individuals and the medical profession as a whole to have to bear the burden of these economic conditions. In the older cities and countries of Europe it is recognized that the state must care for those persons who are ill and improvident, and various types of industrial, health and unemployment insurance have been devised. In America there are state and municipal hospitals, but there is no general system of caring for ambulatory patients with minor or chronic forms of illness which do not require hospital care, and which permit the patient in many instances to work for a part of the time.

In the older cities where there has been extensive poverty for many years, the free medical clinic supported by private charity has been developed to meet these conditions and has been accepted as necessary by the medical profession, although many objections were urged against this in earlier days. In the younger American cities, where the results of our economic and social system are just beginning to make themselves felt, the "free clinic" is again becoming the object of attack by members of the medical profession. A large part of the opposition to such clinics is due to the failure of physicians to grasp the evolving economic conditions underlying the necessity for some efficient form of medical service for the poor and unfortunate of the community. In January of the present year a bill was introduced into several of the state legislatures through the efforts of the Social Insurance Committee of the National Association for Labor Legislation which specifies compulsory health insurance for all families with earnings less than $100 a month. Within the next few years a bill with similar purposes will undoubtedly pass many of our state legislatures, and it will materially affect the practice of medicine and change the character of the present free clinics or dispensaries.

Until some such form of insurance is established, the free clinic is apparently the only solution of the problem which, briefly stated, is to furnish an efficient type of service at the lowest possible cost to those persons who are deserving of free treatment. Although it has no official standing, it has a duty and certain obligations to society at large, to the sick person and to the medical profession. In any discussion these points must be considered and kept in mind, as when the dispensary as at present conducted is viewed from any one aspect alone, a very much distorted conception of the whole is obtained.

THE COST OF LIVING AND ITS RELATION TO FREE MEDICAL TREATMENT

It is apparent to any one giving the matter a few moments' thought that from a financial standpoint there is a line of division between patients entitled

to free treatment and those from whom payment for the physician's services can be rightly expected. This line, or zone as it might better be termed, is to a certain extent a variable one, depending on the conditions present in each individual case, and in a broad way on the relation between the income and cost of treatment. But there is a certain minimum figure or income below which there can be no question as to the financial suitability of an applicant for free treatment.

In its broad aspect this figure should be one which allows of a decent standard of living and includes adequate food, clothing and shelter, for without these three things health will suffer and the race will undergo physical degeneration. Moreover, these are things which society owes to the individual and which are necessary from a moral and ethical standpoint. This necessary income is dependent solely on the cost of living and must be decided on this basis.

There are two methods of obtaining family budgets. One is to figure out theoretically the least a family of a given size can live on and determine the cost of the various items. This method, though frequently used, is inaccurate, and the figure represents not what it actually costs to live, but what the person making the estimate thinks should be allowed. The second method does away with theory and ascertains the cost of living by tabulating the actual budgets or amounts spent by families of different sizes. It is only in this way that figures of any value can be obtained, and only studies in which this method has been used have been utilized in this report.

In many respects the most valuable study in this line was made by Chapin[1] nine years ago. Although in many respects his actual figures are no longer of much value because of the subsequent increase in the cost of living, the method used has served as a model for subsequent investigations, the results of which we have utilized. Chapin's figures are based on the so-called "normal family" of five persons; a working man, a woman at home, and three children under 15 years of age (not producing incomes), and were obtained by compiling the actual figures of a large number of families in regard to the income, and the detailed expenditures for food, clothing, lodging, heat and fuel, insurance, health and sundries. His conclusions were that from $600 to $700 a year income is wholly inadequate to maintain a proper standard of living; with an income between $700 and $800 a family can barely support itself, provided it is subject to no extraordinary expenditures by reason of sickness, death or other untoward circumstances; $825 is sufficient for the average family of five to maintain a fairly proper standard of living in New York City.

In the group of from $700 to $800, the average expenditure was $735.98, which was divided as indicated in Table 1. This sum is $90 less than the figure of $825 which Chapin considered necessary to maintain a decent standard of living for a normal family. It will be noticed that there is no provision for savings or recreation. The division of the clothing item shows how seemingly inadequate the amounts are: total, $98.79 a year; divided into: man, $33; woman, $23; two children, $30 ($15 each); one child, $12.

The point of Chapin's work is this: Normal families were just able to eke out a mere living on an income of between $700 and $800 a year provided no emergency such as ill health arose.

1. Chapin: Standards of Living Among Workingmen's Families in New York City, New York, 1907.

These figures are for 1907, and since that time the cost of living has increased some 16 per cent. according to United States government reports. Within the last year two reports have been issued which we have been able to use and which give more accurate data. One was a very extensive report of the New York State Factory Investigation Commission,[2] in which Chapin's methods were utilized. The other was the report of the New York City Board of Estimates,[3]

TABLE 1.—DISTRIBUTION OF EXPENDITURES ON INCOME BETWEEN $700 AND $800

Items	Amount	Percentage of Total
Food	$335.82	43.6
Rent	161.36	21.9
Clothing	98.79	13.4
Light and fuel	36.94	5.0
Insurance	18.24	4.5
Health	14.02	1.9
Carfare	10.53	1.5
Sundries	60.28	8.2

which studied the cost of living for unskilled laborers. Both reports deal with the cost of living for a normal family in New York City. The total figures are $840.18 and $876.43, respectively. In Table 2 the two budgets are itemized, and in a third column they are averaged.

The average of the two figures is in all probability approximately correct, and will be used as a basis for our purposes. This sum, $858.30, is the actual cost of living for the average normal workingman's family in New York, and is the minimum figure at which a decent and efficient standard of living can be maintained. It includes a figure of $21 a year for health, physicians' and dentists' services and medicine for five persons, and makes no provisions for savings, as the insurance is only burial insurance. Since for our purposes we are trying to obtain a figure below which free medical treatment is unquestionably justifiable, it is necessary to deduct the item for health. As we have no data for subdividing this item, we have deducted the entire sum, $21, making a total of $837.30.

At once the question is raised, Can these figures be used for St. Louis? Is not St. Louis a much less expensive city to live in? If there is any material difference it would be in two of the items, namely, those for food and housing. This point is a very difficult one on which to obtain exact data. In 1909, however, a commission of the British board of trade inves-

TABLE 2.—COST OF LIVING FOR A NORMAL FAMILY IN NEW YORK

Items	Board of Estimate	N. Y. S. Factory Commission	Average
Food	$380.00	$325.00	$352.50
Rent	168.00	200.00	184.00
Clothing	104.00	140.00	122.00
Fuel and light	42.00	20.00	31.00
Carfare	30.30	31.20	30.75
Insurance	22.88	35.60	29.24
Health	20.00	22.00	21.00
Sundries	73.00	102.63	87.81
Totals	$840.18	$876.43	$858.30

tigated the budgets of over 90,000 families in twenty-eight cities in America. In their comparative studies, the cost for housing and food in New York City was placed at 100 units, and this served as a base line. On this basis the cost of housing in St. Louis was 101, and of food 97. In Table 3 the comparative cost of these items for some of the larger American cities

2. Fourth Report of the Factory Investigating Commission, New York, 1915, iv, 1461.

3. Report of the New York City Board of Estimates on the Cost of Living for Unskilled Laborers, New York, 1915.

is given. A combination of these two,[4] food three units and rent one unit, gives: New York, 100; St. Louis, 98.

Therefore we have the right to assume that the figures for New York are approximately (within 2 per cent.) correct for St. Louis.

As the result of some investigations of my own, however, I am convinced that the figure for housing in St. Louis is high. In certain sections of the city, homes of the type which these figures represent are cheaper

TABLE 3.—COMPARATIVE COST OF HOUSING AND FOODS

*Housing**			*Foods†*		
Rank	City	Units	Rank	City	Units
1	St. Louis	101	4	Boston	105
2	New York	100	14	New York	100
8	Boston	82	16	Cleveland	99
10	Philadelphia	79	19	St. Louis	97
17	Chicago	71	22	Philadelphia	96
20	Cleveland	64	25	Chicago	94

* Report, p. 516.
† Report, p. 531.

than in New York. I have therefore deducted 20 per cent. from the cost of housing, and in this way have reached a basic figure of $800. A yearly income for a normal family of five below this figure entitles them to free treatment for any kind of illness and on all occasions.

The average working or laboring man has but little knowledge of his annual income or earnings, and always refers to his earnings by a weekly or monthly wage. If every one were working constantly, week in and week out, it would be a simple matter to divide this figure by fifty-two or by twelve to obtain the weekly or monthly wage needed to make up this sum. But the figure of $800 is based on the cost of living and not on the wage, and hence it is necessary to consider the question of unemployment. Accurate figures for the extent of unemployment are exceedingly difficult to obtain as they fluctuate with trade, season and weather. As one third of the unemployment is attributable to ill health or sickness, we are, from the very nature of our study, dealing with a group of persons in whom unemployment is bound to be high. The best summary of all the available data is that of Nearing,[5] who devotes a chapter to this subject, and who concludes that 20 per cent. of a workingman's time, averaging all industries, and skilled and unskilled labor, is spent in unemployment.

Consequently, unless there is a steady employment, to obtain an annual income of $800, the weekly or monthly wage rate must be 20 per cent. higher than a weekly or monthly rate exactly totaling this sum. In this way (by adding 20 per cent.) we have figured the weekly wage rate sufficient for the bare cost of living for a normal family throughout the year, without provision for health or savings, to be $80 a month or $18.50 a week.

This figure applies to the total income of a normal family in which there is but one wage earner. As the children grow older and begin to earn, the additional wages must be added to that of the man; but it must be remembered that the family expense or cost of living increases at the same time for the clothes, carfare, etc., of the additional wage earner.

From this basic figure it is possible to construct a table of the cost of living for families of different sizes, except for the person living alone. The items undergoing a change in proportion to the size of the family are those of food, rent and clothing, the others remaining more constant. The method used is to add or subtract the proportionate cost for a person of a certain age.

Food is estimated in units based on 10 units for an adult male, and 8 for an adult female (Atwater). The children are reckoned on the basis of 7 units for Child A, from 10 to 15 years; 5 units for Child B, from 5 to 10 years, and 3 units for Child C, under 5 years. Thus a total of 33 units for the normal family is reached. This makes each food unit approximately equal to $11 a year.

The cost of clothing, using $122 as the amount required in a year, is apportioned as follows: man, $45; woman, $32; Child A, $17; Child B, $15; Child C, $13.[6]

If a three room house costs on an average $147 a year, the cost of two rooms is approximately $108 and of four rooms $173 per year. Counting one and one half persons to a room, a recognized standard, we find that a family of two or three requires at least two rooms; four or five, three rooms, and six or seven, four rooms.

From these factors we can obtain the cost of living for families of sizes other than the normal, and the weekly or monthly wage rate necessary to obtain this sum. The factors used for food and clothing are given in Table 4. Two rooms cost approximately $108, or $9 per month; three rooms, $144, or $12 per month, and four rooms, $180, or $15 per month.

As for our purposes a fairly close figure is all that is needed, and as we have a factor of 20 per cent. unemployment which allows for considerable minor fluctuations, we can group the figures of Table 5 into few classes, which is essential for practical purposes (Table 6).

In the matter of persons living alone (boarding) other factors must be considered, and the cost of living cannot be obtained from the figures of a normal family, nor can the same figure be made to apply to the two sexes. A great deal of material has been gathered on the question of the working woman in reference to

TABLE 4.—FACTORS AND EXPENDITURES FOR FOOD AND CLOTHING

Persons	Factors Used		Amount per Year
Adult man	Clothing.. 45	Food.....110	$155
Adult woman	Clothing.. 32	Food..... 88	120
Child A (10-15 years)	Clothing.. 17	Food..... 78	95
Child B (5-10 years)	Clothing.. 15	Food..... 55	70
Child C (under 5 years)	Clothing.. 13	Food..... 32	45

minimum wage legislation, but comparatively little on the expense of a man living independently. It is impossible to consider much of the material in detail, but in making up our estimate the reports of the Oregon, Massachusetts and New York studies have been made use of, and such reports as Bulletin 167 of the United States Bureau of Labor. A good report[2] is that of the New York State Factory Commission for 1915. Certain factors in this report are of interest in our study.

4. Bull. 93, Bureau of Labor, Dept. of Commerce, 1911, p. 536.
5. Nearing: Wages in the United States, New York, The Macmillian Company, 1911.
6. Any one wishing to see what these sums will buy is referred to the New York State Report of the Factory Investigating Commission, p. 1661 et. seq.

First let us consider the cost of living for women at work. About two thirds of the women at work live at home, and in the majority of these homes (four fifths) there is a man at work for wages. So far as we are concerned, we must include the wages added by these additional workers to the total family income. But at the same time there is an increase in the cost of living, as the clothing, food and sundries cost more for the employed woman than for the housewife, in addition to extra carfare. It is obvious that a clerk cannot dress on $33 a year and keep her position. An approximately correct figure can be obtained if $2 a week or $9 a month is added to the cost of living for each "A" child in our tables. This comes fairly near the increased cost for an employed woman or girl in the family. Against this increased cost, however, the additional weekly wage must be added to the income, as we must consider the family income as a whole without paying any attention to its proportional distribution. It is an economic fact that there is a tendency for the earnings of the head of the family to decrease as the children grow up and begin to add to the family income.

For the working woman living independently the factor of board at a profit rather than at cost enters in to increase the cost of living. In addition there is an increase for clothes and laundry which adds considerable to the cost of living. The minimum budget for a working woman in order that she may maintain herself at a standard of decency in New York is given in Table 7.

Inquiries made through the Young Women's Christian Association show that $4 a week for room and board is a minimum standard for St. Louis, and the other items remain the same. This would require a steady income of $8.65 a week with no allowance for health. Adding our 20 per cent. for unemployment (seasonal, industry and health) we find that an income of $10 a week is necessary for a working woman living independently and without family aid to fall back on

TABLE 5.—EXPENDITURES AND NECESSARY INCOMES OF FAMILIES OF DIFFERENT SIZES

Size of Family	Actual Cost of Living a Year	Weekly Wage Required	Monthly Wage Required
Man and woman	$ 554.00	$12.75	$55.50
Man, woman and Child C	599.00	13.85	60.00
Man, woman and Child B	624.00	14.40	62.25
Man, woman and Child A	649.00	15.00	65.00
Man, woman and Children B, C	705.00	16.30	70.50
Man, woman and Children A, B	755.00		
or		17.50	75.00
Man, woman and Children B, C, C	750.00		
Man, woman and Children A, B, C (normal family)	800.00	18.50	80.00
Man, woman and Children A, B, B	825.00	19.25	83.00
Man, woman and Children A, A, B	850.00	19.60	85.00
Man, woman and Children A, B, C, C	881.00	20.15	88.00
Man, woman and Children A, B, B, C	906.00	20.50	90.50
Man, woman and Children A, A, B, C	931.00	21.40	93.00
Man, woman and Children A, A, B, B	985.00	22.70	98.50
Man, woman and Children A, A, B, B, C	1,010.00	23.70	101.00

in case of illness. As a matter of fact, a large percentage of women living independently do have help to fall back on in case of necessity (as ill health) and hence should be regarded with the family income group.

For a man living alone the increased cost is about 10 per cent. additional, or $11 a week. In both cases where there is steady employment the cost of living should not include the 20 per cent. increase. From this brief statement based on studies of minimum wage reports, and the cost of living, we can place our figures as follows:

1. Men or women living independently but with family aid to fall back on in case of necessity (ill health) are to be included with the family group.

2. Men, living independently, at labor in which there is a steady employment, are entitled to free treatment with a weekly wage rate below $9.50 a week.

3. Women under similar conditions are entitled to free treatment at a weekly wage rate below $8.75 a week.

4. Men, living independently, at work in an industry with much unemployment, are entitled to free treatment when the weekly wage rate is below $11.

TABLE 6.—NECESSARY INCOMES OF FAMILIES OF DIFFERENT SIZES

Size of Family	With Average Unemployment Weekly	Monthly	With Steady Monthly Income
Man and woman	$12-$13	$55-$60	$45-$50
Man, woman and child	14- 15	60- 65	50- 55
Man, woman and two children	16- 17	70- 75	60- 65
Man, woman and three children	18- 19	75- 85	65- 70
Man, woman and four children	20- 22	85- 95	72- 77
Man, woman and five children	23- 25	100	85

Women under similar conditions are entitled to free treatment if the weekly wage rate is below $10.

With the basic principle involved in this group there can be no argument. There may perhaps be some ground to question the accuracy of the figures arrived at in our study. In fact, they have been criticized as being too high by some workers to whom they have been submitted and too low by others. They represent, however, so far as I know, the only attempt to work out such a figure on what might be termed a scientific basis. I recognize their shortcomings and limitations.

THE INCOME AND NEEDS OF THE PATIENT IN RELATION TO THE COST OF TREATMENT

Although, theoretically at least, it is possible to set apart one group entitled to free treatment because of an income below a certain fixed figure, it by no means holds that patients with an income above this figure are able to pay for medical services. A great many variables, chiefly the amount of income above the basic line, the nature of the illness, and the cost of efficient treatment, must be considered here. Thus a group of patients with an income slightly above the line of division is able to pay for treatment for a minor illness or injury but would be forced deeply into debt if the illness was long drawn out or of such a nature that the services of a number of skilled specialists were required. A concrete example will serve to illustrate the general question involved: A man with a wife and child has been earning about $80 a month when employed, and has been going to a neighboring physician for years. His income has been just enough to live on efficiently, but not enough to provide for savings. He develops failing vision, and a proper diagnosis requires the services of an ophthalmologist, laryngologist, a neurologist and perhaps an internist or brain surgeon. It is obvious that he cannot pay the average specialist's fees for these examinations and continue to pay his private physician at the same time without lowering the standards of living for his family below the line of efficiency and decency.

We are dealing here with a phase of medicine which is coming more to the front every day and with increasing complexity. With the rapid development of the medical sciences and of delicate laboratory aids in diagnosis and treatment, it is becoming more and more impossible for a physician to cover effectively all fields of medicine, and the resulting specialization in

itself leads to each field becoming more highly specialized. This complexity of modern medicine with its resulting increased cost is an urgent and pressing problem and must be considered.

In attempting to grapple with this problem from the standpoint of the free dispensary, the committee sent out a letter to seventy-seven specialists in four different lines of work in St. Louis, in order to try to find out just what efficient treatment costs in certain conditions. The idea back of the letter was that it might be possible to work out some sort of sliding scale whereby persons with a certain income above the base line would be suitable for free treatment for certain conditions, but not for others, depending entirely on the cost of the medical services required. This we were unable to do in even a rough sort of way. We reached the conclusion that each case must be individualized and settled on its own merits by trained social workers, or, in brief, in the way in which we have been working in the past.

A third group which we were able to set apart is to a certain extent closely allied. It consists of those persons who are "temporarily embarrassed" financially, and whom a helping hand may start on an upgrade which will keep them permanently above the poverty line, while to force them still further into debt would probably end in their becoming permanent dependents,

TABLE 7.—MINIMUM BUDGET FOR A WORKING WOMAN*

Items	Expenditure
Clothing	$ 88.00
Laundry	20.80
Room and board	208.00 ($4 a week)
Lunches	46.80
Carfare	31.20
Insurance	20.00
Amusement and recreation	26.00
Health and incidentals	26.00
Total	$466.80

* New York State Factory Investigating Commission.
Deduct $16 for health, and we have a balance of $450.80

a situation well known to social workers. Although each of these cases must be individualized as in the second group, the group seems to be a distinct one.

A fourth group is one composed of patients sent to the dispensary by a physician with a letter stating that a consultation is desired and that the patient is unable to pay a consultant's fees. These patients are often of distinct value to a teaching clinic, and they represent obscure and unusual conditions.

DISPENSARY ABUSE

I have intentionally reserved until last what, from a logical standpoint perhaps, should have come first, that is, the question of the need for standards and the need for such a study as this. In brief, it is the question of "dispensary abuse." This term is usually used to mean the treatment in a clinic of persons who are able to pay for the services of a private physician. Discussions of this subject are usually prefaced by the citation of an individual case which is magnified into the assumption that the majority of cases coming to the clinic are in the same category. As it is never denied or even assumed by those in charge of a dispensary that a certain proportion treated have imposed on the dispensary, this citation of individual cases is without point.

As a matter of fact, "abuse" as it is seen in a dispensary is a much bigger problem. It includes negligence on the part of physicians, overcharging and petty graft, all of which come to light in studying the histories of a large dispensary. However, as this paper deals with the question of financial suitability, our discussion is limited to the form of "abuse" in the sense in which the term is usually used.

The question must be studied in regard to: what constitutes abuse, the extent of such abuse and the methods of elimination.

By our method of study it is difficult to define what constitutes financial ability to pay for medical services. Primarily, it is a question of income in relation to the cost of living. But we must also take into consideration the type of illness and the cost of treatment. We can fix a line, as we have done, an income below which entitles the patient to free treatment, but above these figures each case becomes a law unto itself. Thus a family of a certain size with an income of $90 a month would be unsuitable for free treatment, but a family of the same size with debts the result of long standing illness might be a very worthy object of charity. We are unable to grasp the logic back of the idea that a case treated free in a physician's office is unsuitable for free treatment in a dispensary, as has been urged, on the ground that the patient may at some time be able to pay for the service. The complexity of modern medicine with the highly specialized departments and intricate methods of laboratory diagnosis have added a more and more complicating factor to the question of whether or not a patient can afford to pay for medical services. Realizing, then, that it is a difficult factor to determine just what constitutes abuse and that above a certain income line every case must be individualized, we can take up the question of how much abuse actually exists.

In 1910, an investigation was made in New York[7] which showed that 672, or 90 per cent., of 745 patients treated were worthy of free treatment, and New York has always been pointed out as a city in which the multiplicity of clinics has fostered this type of abuse. A recent similar investigation covering 1,881 patients applying for admission at the Boston Dispensary showed that only 2 per cent. were able to pay for the services of a private physician.[8] A recent investigation at the Presbyterian Hospital in Philadelphia showed that "abuse" was a very minor factor (2 per cent.).[9]

Some time ago the Washington University Dispensary investigated from a financial standpoint 932 consecutive new patients applying at the desk for admission. Ten per cent. of these were financially unsuitable for free treatment. But of this 10 per cent., 80 per cent. were the type of case which would as a routine be refused admission at the desk or referred to the social service department for further investigation. Thus but two patients in every hundred applying who were not deserving of free treatment would have been treated. This is certainly a small percentage of imposition, and much less, I imagine, than the percentage of the average physician's patients who are "bad pay." The cost and time involved thoroughly to investigate every applicant in order to eliminate this 2 per cent. is not worth the effort or expense. It would be comparable with a physician making a careful financial investigation of each patient in order to eliminate 2 per cent. who were bad pay.

Home investigation, for financial reasons, gives practically no information that cannot be gained on

7. Report of Committee on Dispensary Abuse of the County Medical Society of New York, New York State Jour. Med., 1913, xiii, 48.
8. Davis: Dispensary Abuse, Med. Rec., New York, Sept. 12, 1914.
9. Jobes and Hostetter: Mod. Hosp., 1914, v, 321.

questioning by a competent and experienced investigator. Certain people will lie about their financial condition just as certain others will lie about their taxes or income returns. Experience has shown that in our clinic only 2 per cent. cannot be accepted at their face value, and, as stated, we do not believe that these 2 per cent. are particularly desirable patients for a private practice. It would require the services of a large number of full time workers to make any attempt at more than occasional home investigation, and it has been reckoned that such calls would cost, on an average, from 30 cents to 50 cents for each patient, or from $6,000 to $10,000 a year for our clinic. It must be recognized that a medical clinic is fundamentally a relief charity rather than a corrective one. As a matter of fact, the Washington University clinic spends nearly $100 a month in the matter of investigation to avoid this so-called dispensary abuse, which is a sum, I venture to say, larger than is spent in any other clinic in the United States for the same purpose. We recognize that abuse to a certain extent does creep in, and the committee discussed the question with many physicians with the hope of obtaining some sensible and practical suggestions of methods of elimination. So far the criticism has been purely destructive in character.

At times the dispensary workers feel that the statements made by applicants are untrue. Recognizing that people will often balk at putting in writing what they have stated orally, a simple printed form to be signed stating that the applicant is unable to pay for medical services is desirable, under such circumstances.

It may not be out of place to discuss here the question of patients applying for treatment to the dispensary and not asking or expecting free treatment. Most of these have become dissatisfied with their physician and state frankly that they have lost confidence in him. Many tell stories of gross negligence and incompetence, even malpractice, on the part of the physician. Although most of these stories may be discounted as exaggeration on the part of the patient, it is nevertheless true that many have been "abused" by their physician. These persons do not ask free treatment; they ask only to be referred to a competent physician in whom they can have confidence. The dispensary has a definite moral obligation to the individual and to the community in these cases, and the dispensary admitting office refers them to members of its staff who are also practicing. In these cases the patient and physician do not come into touch with one another at the dispensary, and the patient is referred to the physician without his knowledge. No honest criticism can be directed against this method. The practice of physicians working in a dispensary referring patients to their private offices under the guise of more time required for proper treatment, etc., is an entirely different proposition, and is mentioned only to be condemned.

SUMMARY

Inquiry has shown that a definite standard of financial suitability for admission to free dispensaries has not been based on a study of the economic principles involved. There are two more or less distinct purposes for which dispensaries have been established, namely, for purposes of medical education and as a means of furnishing free treatment to the indigent poor. Each type of dispensary serves a purpose valuable in itself to both the medical profession and the public. Although it is natural to consider whether the same standard of admission is suitable for each type of dispensary, no such difference has been used in working out the standard described in this paper. A basic income has been worked out for various types of families and individuals, below which patients should receive free medical services, and a classified scale is described for extending this standard for specified purposes.

The problem of dispensary abuse is in reality not so big as it is generally considered. Investigation shows that the actual percentage of abuse, where an effort is made to eliminate it, is small, and that but 2 per cent. of the patients being treated at the Washington University Dispensary are financially unsuitable for treatment. The various means so far suggested to eliminate this 2 per cent. are impractical.

St. Louis Children's Hospital.

A CRITICAL ANALYSIS OF OUTPATIENT WORK FROM THE POINT OF VIEW OF EFFICIENCY *

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This statistical study of a number of records of the medical department of an outpatient clinic has been made in the hope that a consideration of the end-results of the various examinations and diagnostic procedures might make for greater efficiency in outpatient work. Such a clinic as the one in which these records were made is coming to do a larger and larger part of the medical work of the community and is, morally at least, responsible to the community for the speed and effectiveness with which it does the work. Time is an item of the greatest importance to these patients, particularly because its loss entails a much larger decrease in income to them than to those of a higher social status. For this reason the time element has been considered along with the other factors in estimating efficiency.

Three hundred and forty-eight records form the basis of this report. Cards were headed with the following questions, the records examined with these points in mind, the case number noted on the card, and the tables and conclusions made later.

1. Age.
2. Sex.
3. Number of visits necessary for diagnosis.
4. Visits after diagnosis.
5. Visits insufficient for diagnosis.
6. Diagnosis made.
7. Roentgen-ray examinations.
8. Von Pirquet tests.
9. Laboratory tests (sputum, stool, blood, kidney function, test-meal, Wassermann).
10. Referred to the hospital.
11. Referred to other departments of the outpatient department.
12. Benefited.
13. Returning after three months.

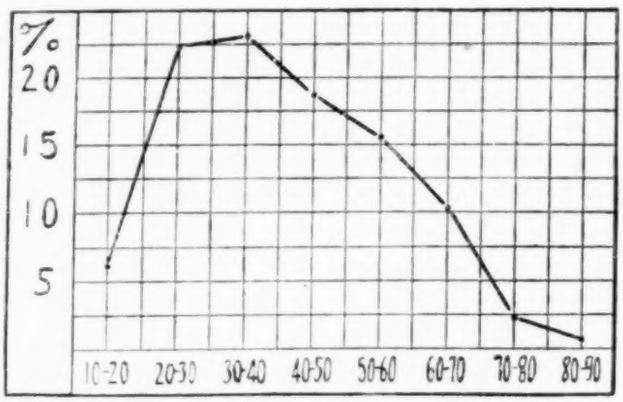
1. *Age.*—The curve plotted in the accompanying chart shows that the second and third decades present a larger percentage of attendance than any of the others. The curve reaches its summit at the third decade, with 23 per cent. of the whole number of patients, and then sinks steadily to the eighth.

* From the University of California Medical School.

Table 1 shows the frequency of the more common diseases in the different decades. Disease of the circulatory system and nephritis increase steadily in frequency with the age up to the seventh decade. Tuberculosis is pretty evenly distributed throughout the whole series. Syphilis plays a proportionately greater part as a diagnosis between the ages of 30 and 50 than at other ages, and the same can be said of ulcer. All the cases of diabetes and pernicious anemia are found in the sixth and seventh decades. A rather remarkable fact demonstrated is that the younger patients are much less liable than the older ones to return a sufficient number of times to permit of a diagnosis being made.

TABLE 1.—FREQUENCY OF DISEASES BY DECADES

	Decade							
	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Number of cases	22	78	81	66	54	26	8	3
Percentages:								
Heart	..	7	9	12	25	41	37	33
Tuberculosis of lung	9	11	9	12	11	8	12	
Syphilis	..	2	8	9	5	2		
Arthritis	13	3	8	12	9	13	25	
Nephritis	..	2	6	4	9	11	25	
Ulcer of stomach and duodenum	..	3	6	7	3	2		
Prostatitis and urethritis	..	3	4	1	3			
Thyroid	4	6	2	6	7			
Appendicitis	..	2	1	3	3	5		
Diabetes	..	..	..	..	11	11		
Carcinoma	..	..	..	3	3	2		
Pernicious anemia	..	..	..	..	3	2		
Cholecystitis	4	2	1	4				
Visits insufficient for diagnosis	27	17	7	9	5			



Percentage of attendance by decades; the ordinates represent the percentage of patients, the abscissas the decades. The second and third decades show a larger percentage of patients than any of the others.

2. Sex. — There were 192, or 55 per cent., of male, and 156, or 45 per cent., of female patients.

3. Number of Visits Necessary for Diagnosis.—An outpatient department is in the position of having to do a large amount of work speedily, but above all accurately. Because of reasons already mentioned, time is an important consideration to these patients, and, so far as possible, the aim should be to come to some definite conclusion as to the cause of the patient's symptoms with the minimum number of visits. If the cases are grouped according to the number of visits necessary for diagnosis, the results given in Table 2 are obtained.

The number of visits required proportionately by each of the more frequent diseases is given in Table 3. Eighty-four per cent. of the cases of tuberculosis of the lungs were diagnosed in three visits, a fairly good result considering the difficulty of determining whether a lesion in the lung is or has been tuberculous and whether it is or is not active. That so large a number should have had to come more than twice is due to the repeating of sputum examinations which proved negative on the first search for tubercle bacilli. The advisability of thus repeating the sputum examination is questionable, and the examiner would probably do better to rely on his history and physical findings, having only one sputum examination to aid his clinical judgment. Disease of the heart or vessels was generally easily determined, the question here being just what part the kidneys played in the clinical picture. In many of these cases the phenolsulphonephthalein test was performed, this necessitating an extra visit. As will be shown later, this test is of doubtful benefit in the type of cases seen oftenest in the outpatient departments, and the extra visit which it requires might well be saved by its omission. Thyroid dystrophy, diabetes, appendicitis, syphilis and bronchitis were practically all diagnosed in two visits. Nephritis required usually two or three. Eliminating the phenolsulphonephthalein test here, too, would reduce the number of visits made by these patients by 40 per cent. Ulcer cases in which test meals and roentgenograms were taken as a routine required three or four visits, and this number does not seem too high when the amount of work necessary is considered. It seems possible, then, to reach in two visits a conclusion as to the cause of the patient's symptoms, in the commoner diseases, excluding, of course, ulcer.

4. Visits After Diagnosis.—Of the whole number, 133, or 38 per cent., returned after a diagnosis had been made. It is not possible to determine from the records just what percentage lived outside of this city, but the impression is left that a definite number come from the country to the clinics merely for diagnosis and form a part of the 62 per cent. who never return. Another part is formed by those who are reassured when informed of the triviality of their complaint. Others fail to return after they have established the nature of their ailment because we can give them practically no assurance of any considerable benefit that will result. Much of the patient's attitude toward his disease is reflected from that of his physician. If the latter is hopeful of improvement, the patient will be correspondingly so. The introduction of the principle of focal infection has marked a great advance in therapy in that improvement may be looked for in cases which heretofore have been treated only symptomatically. Many patients who are instructed to return from time to time but fail to do so could be brought back to the clinic by a follow-up system.

TABLE 2.—NUMBER OF VISITS NECESSARY FOR DIAGNOSIS

Visit at Which Diagnosis Was Made	Number	Percentage of the Whole
First	95	27
Second	82	24
Third	45	12
Fourth	20	5
Fifth or later	13	3

5. Visits Insufficient for Diagnosis. — Forty-one patients, or 11 per cent. of the whole number, did not make a sufficient number of visits to justify making

a diagnosis. This means a large loss of time and efficiency, part of which could be avoided. A certain portion of the responsibility for this falls on the physician either because he is unable to form a judgment as to the cause of the complaint or because he does not impress the patient with his ability to do so. A larger share, however, must rest with patients who, after taking whatever time is necesary for a preliminary examination, fail to return for completion of the work. Many of these people could be eliminated by the institution of an examining department to which the patient would be referred immediately after registration. Here a brief survey could be made without writing elaborate records, and, if the complaint did not merit further attention, the patient could be dismissed at once. This would sift out the greater part of the class who do not return a sufficient number of times for diagnosis, and at least assure that the more important cases received the proper time and attention.

6. *Diagnosis Made.*—A diagnosis was not found on sixty-eight, or 19 per cent. of the cards. Subtracting the number of patients who did not come sufficiently often to establish a diagnosis, there remain twenty-seven cases, or 7 per cent. of the whole number, in which a definite opinion could not be reached.

7. *Roentgen-Ray Examinations.*—Roentgenograms were made for eighty-four, or 24 per cent., of the patients. They play by far the largest part in the diagnosis of gastro-intestinal conditions, but large numbers have been taken to show joint lesions and in search for alveolar abscesses. In fifty-six cases, or 66 per cent., of those who had roentgenograms, the plates or screen examinations showed a pathologic process. The remaining plates were negative except so far as they helped to rule out certain conditions.

8. *Von Pirquet Tests.*—Tuberculin skin tests were done quite frequently in the first half of the series, and then almost completely abandoned. Altogether the test was performed on twenty-six patients, or 7 per cent. of the whole number. Table 4 shows the results.

In three cases the results are not recorded or the patients failed to return for a reading of the test. It would seem that the von Pirquet test as done in this small series of cases was of no value except when negative.

TABLE 3.—PROPORTIONATE NUMBER OF VISITS REQUIRED

Disease	No.	Number of Visits for Diagnosis				
		1 per Cent.	2 per Cent.	3 per Cent.	4 per Cent.	5 per Cent.
Tuberculosis of lungs	41	24	29	21	7	7
Circulatory system	50	50	34	12	4	
Arthritis	29	55	34	10		
Thyroid	13	61	38			
Diabetes	9	77	22			
Appendicitis	6	100				
Syphilis	16	31	68			
Bronchitis	7	57	42			
Nephritis	20	10	40	40	..	10
Ulcer	14	..	21	42	28	7

9. *Laboratory Tests.*—(*a*) Sputum examinations were made for thirty-six patients, or 10 per cent. of the whole series. In some cases the examination was repeated two or three times. Tubercle bacilli were found only five times, influenza bacilli once. Thus there were about 83 per cent. of negative examinations, and in three cases the specimens were from patients with very evidently active tuberculosis. The diagnosis of active tuberculosis was made in twelve cases without sputum examinations, sometimes because there was no expectoration, and sometimes because it was considered desirable to place the patient in the tuberculosis clinic at the earliest possible moment. Generally it would seem best to make only one examination of the sputum.

(*b*) Stool examinations were made for forty-eight patients, or 13 per cent. of the whole. Pathogenic amebas were found three times, *Taenia uncinaria* and *Trichomonas* each once. Occult blood was found in ten cases. Five of these were ulcer, three were carcinoma, in one the diagnosis was doubtful, and in another the test showed the merest trace. The presence of occult blood in the stools while the patient was on a meat-free diet seems to have had great significance in this small series of cases.

TABLE 4.—RESULTS OF VON PIRQUET TESTS

Von Pirquet Test	Final Diagnosis		
	Process Active	Process Arrested	No Tuberculosis
Slight	1	3	4
Moderate	4	0	3
Marked	1	2	2
Negative	0	0	4

(*c*) Blood examinations were made in thirty-two, or 9 per cent. of the total number. Among the patients on whom complete blood counts were made there were three cases of pernicious anemia, one case of chlorosis, one case of hemolytic icterus, and five cases of secondary anemia due, respectively, to uncinariasis, chronic tonsillitis, carcinoma of the pancreas, menorrhagia and Hodgkin's disease. Plasmodia were found twice. In all, about 31 per cent. of the blood examinations were negative in spite of the fact that the counts were made by the examining physician himself.

(*d*) The phenolsulphonephthalein test for kidney function was done twenty-six times, or in 7 per cent. of the cases. The time required by it can be ill afforded unless it gives definite and decisive information. It was used rather frequently during the first half of the series, and then given up almost entirely because it was felt that the results did not justify the expenditure of time. Although there were fourteen cases with a blood pressure of 160 or higher, and eleven of these had albumin in the urine, there was only one patient with hypertension who had a phenolsulphonephthalein excretion of under 50 per cent. in two hours. We must suppose that some of these cases had a certain amount of kidney damage, but the phenolsulphonephthalein test does not enable us to distinguish the mild nephritides from the simple hypertensions, at least not as demonstrated in this small series.

(*e*) Test meals were given in fifty-five cases, or in 15 per cent. of the whole number of patients. Except for ten cases in which the fractional method was used, the Ewald meal was employed as a routine and the stomach emptied in three quarters of an hour. On a number of the histories the data obtained are absent in part so that there remain but twenty-two cases in which the full results were satisfactorily recorded. Ten of these had a content of 100 c.c. or over, and among the ten there were six cases of ulcer, one case of pyloric stenosis, probably from an old ulcer, one case of perigastric adhesions, and one case with frequent blood in the stools and much nausea but a negative Roentgen-ray examination. Seventy per cent. of

the patients in the series with an abnormally high content were ulcer cases, 60 per cent. complained of vomiting, and 30 per cent. showed a residue in six hours by the Roentgen-ray examination. Twelve patients had a content of less than 100 c.c. Twenty-five per cent. of these were ulcer cases, 25 per cent. complained of vomiting, and none showed a six-hour residue by the Roentgen-ray examination. Of those that vomited, two were not stomach cases. Thus a stomach content of 100 c.c. or more in these patients was frequently accompanied by ulcer and by a history of vomiting, and the Roentgen ray often confirmed the delay in the passage of the stomach content to the duodenum. On the other hand, a content of less than 100 c.c. was infrequently accompanied by ulcer, and when there was a history of vomiting it was more often due to gallbladder or perigastric disease. The fractional method did not give results that justified the large expenditure of time.

(*f*) The Wassermann test was made on 169 patients, or 48 per cent. of the whole number. Syphilis was diagnosticated in twenty-one, or 6 per cent. of the cases, six times when the test was negative. Among the fifteen who had a positive Wassermann test, eleven, or 73 per cent., showed signs that suggested syphilis at once, and four, or 26 per cent., though they did not show these signs, gave a history of a genital sore which would have led to a Wassermann test. These figures suggest that syphilis is discoverable in the history or in the physical examination in the vast majority of cases. Eighty-seven per cent. of the patients whose blood was tested had a negative report and did not present enough evidence to diagnosticate syphilis, though a certain number gave a history of a soft sore or had an enlarged spleen or fundus changes. The conclusion is evident that the complement fixation test was used in a great many cases for insufficient cause.

10. Twenty-nine, or 8 per cent., of the patients in this series were referred to the hospital for investigation or treatment. Twenty-two, or 74 per cent. of those admitted, were given an admission diagnosis which was corroborated or not made more definite in the hospital. The efficiency of the outpatient department, then, as regards cases which could be more fully investigated was roughly 75 per cent.

11. One hundred and ten, or 31 per cent., of the patients were referred to other departments of the outpatient department for examination and advice. A few of these cases were frankly not medical, but most of the number had been properly sent to the medical department for examination. Sending these patients for consultation is a very time consuming procedure, for it usually means that the patient is obliged to spend another morning to get the opinion of the department to which he is referred, and still another to report to the medical department again. This can be avoided by equipping the medical department so that the ordinary pelvic, prostatic, ophthalmoscopic and orthopedic examinations may be made without referring the patient to another department. In the greater number of cases the opinions thus obtained are sufficient for diagnosis and the patient can later be referred to the proper department for treatment when this is necessary.

12. It is found very difficult to obtain from records any definite idea of just what benefit, if any, is experienced by the patients. An examination of the 348 records shows that 130 have had some benefit from their treatment but that the remaining 218, or 62 per cent., cannot be said to have profited from their visits to the clinic. This number, of course, is largely made up of patients who failed to return a sufficient number of times for diagnosis, of those who for some reason could not return, of those suffering from conditions which by their nature were not liable to improvement or even to alleviation, and finally of those who unfortunately were incorrectly diagnosed. It is possible that early and thorough treatment of gonorrhea, prolonged treatment of syphilis, proper oral hygiene, and care of necrotic teeth will prevent the development of many cases of chronic arthritis, endocarditis and nervous and circulatory disease, so that in the next ten or twenty years the number of patients benefited will increase. The fact remains that 62 per cent. of the patients in this series failed to show any improvement.

13. In order to get an idea of the hold that the clinics have on the patients, the total period of time that they visited the department was noted. It was found that only sixty-one, or 17 per cent., returned after three months, in spite of the fact that they are urged to return from time to time for advice or further treatment, and that the ones who did return after this period were usually those on whom the examining physician had more or less of a personal hold. The speed with which the case was handled was also a factor.

CONCLUSIONS

It is obvious from an examination of the preceding figures that the number of cases is too small to determine the value of the different laboratory procedures. They are merely suggestive and might form the basis of future investigation in which a larger number of cases could be considered with these points in mind. Certain facts are brought out, however, and the following conclusions seem justified:

1. Thirty-eight per cent. of the patients failed to return after diagnosis. The introduction of a follow-up system would decrease this percentage.

2. Eleven per cent. of the patients did not return a sufficient number of times to justify making a diagnosis. The institution of a department for preliminary examination of the patients is suggested in order to assign the cases to the proper departments and to eliminate those who come for trivial causes.

3. There were twenty-seven cases, or 7 per cent., of the whole number, in which it was not found possible to make a definite diagnosis.

4. Seventy-five per cent. of the patients sent to the hospital for further examination or treatment had a correct admission diagnosis.

5. Much of the time lost in referring patients to other clinics for consultation might be saved by equipping the medical department for the commoner special examinations.

6. Only 38 per cent. of the patients in this series were benefited by their visits to the clinics.

7. Eighty-three per cent. of the patients did not return to the clinics after three months.

I feel that those who have taken an interested part in outpatient work will agree that there is here the same need for careful attention to detail and effectiveness as in hospital work, but that this is rarely given. The figures show that this work, when considered from the point of view of the end-results, is disappointing, and they are given with the hope of stimulating interest in outpatient work and raising its standard.

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IMMUNITY CONFERRED BY THE TRANSFER OF IMMUNE AND OF MIXED IMMUNE AND SENSITIZED SERUMS*

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We venture to present a few facts on an intricate subject, conscious that their full meaning and value must await the verdict of prolonged research.

In a recent investigation by two of us[1] it was found that when horse serum was dropped into the nose of a guinea-pig on alternate days, as few as four times, the animal became biologically modified in one of two opposite directions. A "toxic" injection of a large dose of serum given by the vein sixteen days after the last instillation could strongly shock or kill the guinea-pig. That is, the animal had become "sensitized" to the horse serum absorbed through the mucous membrane of the nose as if it had been given by subcutaneous injection. In certain animals, however, the toxic injection of horse serum not only did not kill, but produced scarcely noticeable symptoms of reaction.

Such a result would be attributed to incomplete absorption of the antigen were it not that a second large intravenous injection of serum, given two weeks after the first, was likewise frequently withstood.

In the work referred to it was found that the quality of the effect depended on the quantity of the serum instilled. A dosage of 0.2 c.c. of horse serum generally produced fatal anaphylaxis, while a dose of 0.04 c.c. commonly conferred tolerance.

We could explain our results only on the hypothesis that the absorption of horse serum, according to dosage, initiated in the guinea-pig two opposite reactions, one of which was manifested by the anaphylactic state and the other by a condition of primary increased tolerance for the antigen. We further found that guinea-pigs prepared by a course of nasal instillations of serum, as compared with animals prepared by massive intraperitoneal injections, responded differently to a series of intravenous injections of horse serum. Animals given the preliminary treatments by the parenteral route, as is well known, tolerate continuously increased amounts of serum in spaced intravenous injections; but if a long resting period, say upward of 100 days, intervenes, there is more or less pronounced return toward hypersensitiveness.

When, on the contrary, guinea-pigs prepared by the nasal instillation of serum are submitted to a similar course of intravenous injections, tolerance for the antigen apparently increases with the length of the resting period, at least during the lapse of 125 days.

One of the fundamental data of immunology is the presence in the blood of an animal sensitized to a foreign serum of an anaphylactic antibody. When the serum of an animal sensitized to horse serum is injected into the peritoneal cavity of a normal guinea-pig, this creature itself passively acquires hypersensitiveness to horse serum.

In the present work we undertook to solve the following apparently simple problem: Given two guinea-pigs, one of which is hypersensitive to horse serum and the other resistant to it, does the serum of the latter animal contain anything which may neutralize or modify the admitted anaphylactic effects induced by the serum of the hypersensitive animal? An affirmative result would suggest the hypothesis of an "immune body" functionally opposite in action to that concerned in anaphylactic reactions.

The meager results thus far obtained are presented now only because it has become necessary to postpone indefinitely continuation of the work. This survey has employed seventy-two animals in twelve series of experiments. The crucial purpose of each group of experiments was to obtain the blood serum of two guinea-pigs, one of which was highly resistant and the other highly sensitive to the intravenous injection of horse serum. The donor pigs were bled directly into tubes in which the serum was separated by centrifugation within half an hour. The serums from the two animals were injected at once, separately and mixed in various proportions, into the peritoneal cavities of normal guinea-pigs having an average weight of 300 gm. The mixed serums were incubated together for from fifteen to forty minutes, either at room temperature or at 37 C. (98.6 F.) before injection. After a resting period of from two to three days, these pigs received an intravenous injection of 0.25 c.c. of horse serum and, in case of survival, the injection was repeated at intervals of fourteen days or more.

Our usual method of procedure was to inject 3 c.c. of the serum from sensitive and resistant animals, respectively, into two normal guinea-pigs, and then mixtures of serums in the proportions $3 + 1$, $1 + 3$ and $1 + 1$ into other normal animals. Our first technical difficulty was encountered in the preparation of animals with such a high blood content of anaphylactic antibody that a normal pig receiving 3 c.c. of the serum would succumb in forty-eight hours to the intravenous injection of 0.25 c.c. of horse serum. In most cases the recipient pig was only shocked with the first intravenous injection, succumbing to the second. The usual preparatory treatment of pigs designed to develop anaphylactic antibodies consisted in from three to four daily intraperitoneal injections of from 2 to 5 c.c. of horse serum, the pigs being bled from fourteen to forty-eight days later.

It is obvious that the degree of sensitization acquired by the normal pigs, as a result of the intraperitoneal injection of sensitized serum, would be manifested as an anaphylactic response to the first intravenous injection of horse serum.

Eight of the forty-six normal animals receiving the serum of treated pigs died with the first intravenous injection of horse serum. Three showed no definite reaction, one of these succumbing to the second intravenous injection. The remainder showed a varying degree of reaction.

It is further obvious that the first intravenous injection of 0.25 c.c. of horse serum would, under ordinary conditions, strongly sensitize the guinea-pigs so that they would invariably succumb to a second injection of a like amount repeated after fourteen days or longer.

Our experiments show, however, that eleven of the forty-six pigs receiving serum of the treated animals withstood the second intravenous injection, and seven withstood three or more such injections, none of these, in fact, dying under treatment. The guinea-pigs used

* Read before the Section on Practice of Medicine at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Sewall, Henry, and Powell, Cuthbert: On the Conditions and Characters of the Immunity Produced in Guinea-Pigs by Instillation of Horse Serum into the Nose, Jour. Exper. Med., 1916, xxiv, No. 1.

as donors of serum may be divided into two general classes. Those of the first class had been treated by the instillation of horse serum into the nose, but did not receive thereafter the usual intravenous injection of this serum. Half of these animals were instilled with what we call "protective" doses of 0.04 c.c. of horse serum, and half with "sensitizing" doses of 0.2 c.c. of the serum. From the results of parallel experiments it was assumed that the animals instilled with the smaller dosage would have withstood an intravenous injection of 0.25 c.c. of horse serum in sixteen days, and that those instilled with the larger dosage would have succumbed to such an injection. More ample experience has shown that this sharp biologic distinction between animals according to the amount of antigen which they have received cannot always be predicated; nevertheless it is obvious that remarkable and specific properties may be acquired by the serum of guinea-pigs treated only by instillation of horse serum, without subsequent reinforcement with intravenous injection. This is shown in Table 1.

The letter L in the table signifies that the guinea-pig survived its intravenous injection with scarcely perceptible reaction; the number of + signs indicates degrees in severity of anaphylactic shock.

It will be seen in the third column that every pig was to a degree sensitized by the intraperitoneal injection of serum from the donor animals. In the fourth column we see that pigs Nos. 5 and 6, which had received mixtures of serum from donors A and B (the mixtures having stood at room temperature for about thirteen minutes) survived the second intravenous injection, and repetitions of the same at various intervals and with increasing dosage.

We defer speculation as to the meaning of these facts until the general discussion at the close of this

TABLE 1.—EXPERIMENTS WITH SERUM OF GUINEA-PIGS TREATED ONLY BY INSTILLATION OF HORSE SERUM

Donor Pigs[1]	Normal Pigs	Serum Intraperitoneally, C.c.	Results of Intravenous Injection of Horse Serum[2] 0.25 C.c. First, 48 Hrs. After Intraperitoneal	Second, 15 Days After First Intravenous	Third, 14 Days After Second Intravenous	Fourth, 17 Days After Third Intravenous	0.38 C.c. Fifth, 12 Days After Fourth Intravenous	Sixth, 59 Days After Fifth Intravenous
A	1	0.75	L	D				
A	2	4	L ++	D				
B	3	0.5	L +	D				
B	4	3.25	L +++	D				
A & B	5	A, 0.75 B, 2	L +	L +++	++++	L +++	L +	L +
A & B	6	A, 2 B, 0.5	L +	L +++	L +++	L +	L	L

[1] In this and the following tables, D means "dies"; L means "lives after very slight reaction"; L ++++ means "very severe reaction."
[2] Preparation of donor pigs: A, immune; received six nasal instillations of 0.04 c.c. horse serum, alternate days; B, sensitive; like treatment with 0.2 c.c. horse serum. Both bled after 21 days.

article. Suffice it now to postulate that the recipient Guinea-Pigs 5 and 6 have acquired an active immunity. One hundred and nineteen days elapsed between the intraperitoneal injection of immune serum and the last intravenous injection of horse serum. During this time six injections of horse serum were given and, in spite of the increase in the amount of antigen, the immunity of the pigs was progressively strengthened after the third treatment.

In numerous experiments which we have performed on pigs born of immune and sensitive mothers, never have we seen one survive the second intravenous injection of horse serum. It might be maintained, of course, that our Pigs 5 and 6 acquired their active immunity from the small residue of horse serum remaining free in the circulation of the donors A and B, but, as will be seen shortly, such an explanation is scarcely tenable. Nevertheless, this interpretation of the results is perhaps supported by the data conveyed in Table 2.

In this experiment both donor pigs were highly immunized against horse serum. After six nasal instillations of 0.04 c.c. of horse serum, each withstood, with scarcely perceptible reaction, the intravenous injection of 0.38 c.c. of horse serum after sixteen days. Sixteen days later a similar injection was borne with moderate reaction. Sixty-seven days later A reacted moderately to an intravenous injection of horse serum increased to 0.75 c.c., and in sixty-nine days B responded in the same way to an intravenous injection of 0.88 c.c. of horse serum. These pigs were bled at the same time, A nineteen days after receiving 0.75 c.c. of horse serum, and B seventeen days after receiving 0.88 c.c. of the serum. It is seen that the normal recipient of B's serum died with the first intravenous injection, while the other two recipients were immunized. The mixed serums of A and B were incubated at 37 C. for twelve minutes.

TABLE 2.—EXPERIMENTS WITH SERUM OF GUINEA-PIGS HIGHLY IMMUNIZED AGAINST HORSE SERUM

Donor Pigs[1]	Normal Pigs	Serum Intraperitoneally, C.c.	Results of Intravenous Injections of 0.25 C.c. Horse Serum: First, 47 Hours After Intraperitoneal	Second, 19 Days After First Intravenous	Third, 16 Days After Second Intravenous	Fourth, 45 Days After Third Intravenous
A	1	3	L	L	L +	L ++
B	2	3	D			
A & B	3	A, 1 B, 1	L	L ++	L +++	L ++

[1] Donor pigs treated by a course of nasal instillations and later by intravenous injections of horse serum. A was bled 19 days after last intravenous of 0.75 c.c. horse serum. B was bled 17 days after intravenous of 0.88 c.c. horse serum.

It is worth while noting that the immunity conferred on normal guinea-pigs by this method usually develops more slowly and less perfectly than in animals immunized after a course of nasal instillations of horse serum.[1]

Our experiments substantiate the opinion that the effect of serum transferred by intraperitoneal injection to a normal animal depends not only on its composition but also on the quantity injected and, when mixtures of the serum are used, on the relative amounts of "immune" and "sensitive" serum employed.

Our experiments are far too limited in number to establish the quantitative relations of the variables in this supremely practical problem. Nevertheless, certion conclusions seem to be indicated, thus: mixtures of immune and sensitive serums appear to be more potent to confer immunity on the normal guinea-pig than immune serum alone, and those mixtures which contain the smaller proportion of immune serum are apparently most effective in this direction.

Mixtures of the serum of two hypersensitive donors, on the other hand, appear to be quantitatively more potent to induce the anaphylactic state in normal pigs than either serum alone.

In Table 3 the results of three series of experiments are condensed. In the first, the immune Pig A, after a course of nasal instillations with horse serum, had received at long intervals five intravenous injections of horse serum, the last, amounting to 0.75 c.c., being given 116 days before the pig was bled. The animal was a female, and offspring born to it late in the treatment were completely refractory to subcutaneous injection of 0.1 c.c. of horse serum, while offspring of a sensitive mother succumbed to such an injection. Pig B was bled twenty-five days after its course of intraperitoneal injections; its serum, no doubt, would have been richer in anaphylactic antibodies had a longer

TABLE 3.—RESULTS OF THREE SERIES OF EXPERIMENTS

Immune Pigs*	Normal Pigs	Mixed Serum Intraperitoneally, C.c.	Results of Intravenous Injections of 0.25 C.c. Horse Serum: First, 62 Hours After Intraperitoneal	Second, 14 Days After First Intravenous	Third, 13 Days After Second Intravenous	Fourth, 14 Days After Third Intravenous	Fifth, 33 Days After Fourth Intravenous
A & B	1	A, 0.5 B, 1.5	L +	D			
A & B	2	A, 1.5 B, 2.5	L + +	L + + +	L + + +	L +	T
		Separate and Mixed Serums	First, 37 Hours After Intraperitoneal	Second, 15 Days After First Intravenous	Third, 13 Days After Second Intravenous	Fourth, 36 Days After Third Intravenous	
C	1	3	L	L + +	L +	L	
D	2	3	D				
C & D	3	C, 3 D, 1	L +	D			
C & D	4	C, 1 D, 3	L + +	D			
		Separate and Mixed Serums	First, 37 Hours After Intraperitoneal	Second, 14 Days After First Intravenous	Third, 42 Days After Second Intravenous		
E	1	5	L +	L + + +	D		
E	2	2	L + +	D			
E & F	3	E, 2 F, 2	L +	L + +	D		
E & F	4	E, 1 F, 2	L +	L + +	L + +		

* Preparation of donor pigs: A, immune pig; 6 nasal instillations, 0.2 c.c. horse serum followed by 5 intravenous injections in 5 months; last intravenous of 0.75 c.c. horse serum given 116 days before bleeding. B, sensitized pig; 4 intraperitoneal injections of from 2 to 5 c.c. horse serum daily; bled 25 days after last intraperitoneal. C, immune pig; 4 nasal instillations of 0.2 c.c. horse serum followed by 3 intravenous injections of horse serum in 51 days; last intravenous of 0.5 c.c. horse serum given 103 days before bleeding. D, sensitized pig; prepared like B, but bled 41 days after last intraperitoneal. E, immune pig; prepared by 12 daily instillations of 0.02 c.c. horse serum followed by 2 intravenous injections of horse serum within 3 weeks; last intravenous of 0.28 c.c. horse serum 107 days before bleeding. F, sensitized pig; three intraperitoneal injections of horse serum, from 1 to 4 c.c. daily; bled 17 days after last intraperitoneal.

interval elapsed. It is noticed that a stronger protection is afforded by the serum mixture containing the smaller amount of "immune" serum A. The same result is noted in Pig 4 of the third experiment. In the second experiment 3 c.c. of the serum of the sensitive Pig D contained enough anaphylactic antibodies to make the normal Pig 2 fatally sensitive to an intravenous injection of horse serum. Although the serum of the immune Pig C was rich enough in protective substance to protect Pig 1 against a series of intravenous injections of horse serum, it could only partly inhibit the fatal effect of the serum of D when mixed with it.

After it had been determined that immune serum and mixtures of immune and sensitized serum inoculated into normal guinea-pigs could protect them against anaphylactic death following intravenous injection of the antigen, it was obviously desirable to determine whether animals already hypersensitive to horse serum could be desensitized by similar treatment. A considerable number of experiments were performed in which guinea-pigs, sensitized to horse serum by subcutaneous injection, were given intraperitoneal injections of from 3 to 5 c.c. or more of serum and its mixtures, which probably would have protected normal animals against anaphylaxis. Each recipient pig was treated by an intravenous injection of horse serum in from three to seven days after the intraperitoneal injection, and each promptly died. We conclude that *prophylaxis* and *cure* of sensitization are practically independent problems. A useful discussion of the essential differences between prophylactic and therapeutic vaccination has been given by Theobald Smith.[2]

COMMENTS

The present work must be considered in the light of facts announced in the previous article,[3] of which it is a continuation.

We are strengthened in the opinion expressed a year ago[3] that two different reaction bodies are formed in a normal animal when a foreign protein is introduced into its circulation. One of these is the anaphylactic antibody familiar to literature. The other is a protective antibody which averts the changes which result in anaphylactic shock. These antibodies probably always exist together in the circulation but, according to circumstances, in very different proportion. In the donor pigs which we have termed "sensitive" the anaphylactic antibody greatly predominates, while in the "immune" pigs the protective antibody is more or less pure. It is characteristic of the metabolism set up by the repeated absorption of very small quantities of horse serum by the nose that it results in the preponderant formation of the protective antibody. In an important research by Gurd,[4] conclusions are expressed which agree, in parts, exactly with our own:

> The experiments . . . are interpreted by the author as proving the presence, in the circulating blood of immune animals, of bodies which are potent to induce the hypersensitive state when introduced into normal animals and also of bodies which if injected in sufficient quantities are able to render normal animals immune.

We have shown that our "immune" serum, that presumably surcharged with protective antibodies, is alone capable of protecting normal guinea-pigs against a series of inoculations of horse serum, and that mixtures of "immune" and anaphylactic serums appear to be still more potent in this direction.

Considerable evidence has been developed, both from laboratory and clinical fields, which supports the view that a disease-producing organism or substance when combined with certain contents of immune serum has a peculiarly vaccinating or even curative effect.[5] Theobald Smith[6] seven years ago suggested the employment of mixtures of toxin-antitoxin in the prophylaxis of diphtheria. The more recent use of "sensitized" vaccines is evidently founded on the same principle.

2. Smith, Theobald: Boston Med. and Surg. Jour., 1910, clxiii, 775.
3. Sewall, Henry and Powell, Cuthbert: Studies on the Relations of the Hypersusceptibility and Insusceptibility Induced in Guinea-Pigs by the Instillation of Horse Serum into the Nose, Arch. Int. Med., October, 1915, p. 605.
4. Gurd, F. B.: Jour. Med. Research, 1914, xxxi, 205.
5. Wood, F. C., in Forchheimer's Therapeusis of Internal Diseases, 1914, i, 125.
6. Smith, Theobald: Jour. Exper. Med., 1909, xi, 241.

A rich experience has been accumulated by students of hog cholera.[7] Prophylaxis against this disease may be secured by the subcutaneous inoculation of normal animals with "hyperimmune" serum, that is, serum from immune hogs that have withstood inoculation with actively infected blood. This treatment is not curative of the disease, and its protective power disappears after a few weeks. Prophylaxis by the "simultaneous" method is much more effective. According to this plan, a considerable quantity of hyperimmune serum is injected under the skin on one side of the animal, and a small amount of virulent blood is injected on the other side. The protection conferred is said to last throughout life, and hogs actually sick with the disease are cured in a considerable proportion of cases. Duval and Couret[8] have recently reported highly successful vaccination with "desiccated, sensitized hog cholera virus." They incubate the diseased tissues with hyperimmune serum, then dry and reduce them to a powder which is found effective for prophylaxis in exceedingly small amounts.

We venture to offer the following explanation of the facts presented: The protective antibodies of our immune pigs when injected into normal animals combine with cells and initiate in them the tendency to produce similar antibodies under appropriate stimulation. Such stimulation is found in the antigen contained in horse serum. The result of such injection is a response of the body cells by which they produce such excess of protective over anaphylactic antibodies that repeated injections of horse serum are withstood. The evidence is that the effect of the protective antibody in directing the tissue metabolism is greatly enhanced by the presence in certain proportion of anaphylactic antibodies as found in the mixed serums. This is seen in Table 1. The rôle, then, of these reaction bodies injected into the normal animal is to modify cellular irritability in a manner to lead to the speedy and preponderant formation of "protective" antibodies under the stimulus of the antigen, and thus initiate the course of active immunity. The final status of the irritability of a living cell is determined, not only by the kind and amount of stimulating material invading it, but also by the metabolic predisposition of the cell at the moment of contact.

SUMMARY AND CONCLUSION

Our work was undertaken with the design of discovering whether the blood serum of guinea-pigs rendered immune to considerable intravenous injections of horse serum by a preceding course of nasal instillation of the serum has a different biologic effect from the serum of highly sensitive animals, when injected intraperitoneally into normal guinea-pigs. We have found that the serum of animals which we call immune can confer on normal guinea-pigs a resistance against a long succession of intravenous injections of the same antigen. It is also probable that mixtures of immune and sensitive serums in certain proportions give still greater protective effects. Notwithstanding the numerical inadequacy of these experiments, we believe that, taken in connection with the broader research,[1] they justify the following tentative conclusion: A foreign protein injected into a normal animal sets up reactive processes leading to the formation, in this field, of two antibodies having opposite characters; one tends to induce, and the other to avert, the establishment of the anaphylactic state.

Serum containing an excess of the anaphylactic antibody, when transferred to normal animals, renders them, as is well known, passively anaphylactic. Serum containing a sufficient excess of the "protective" antibody, when transferred to normal animals, initiates in them the phenomena of active immunity. Mixtures of the two types of serum seem still more effective in conferring immunity.

The metabolism of the body cells is specifically modified by combination with these antibodies in such a way as to give rise to hypersensitization on the one hand or to active immunity on the other.

If our interpretation of these results is correct, it is evident that new definitions must be given for "immune" serums.

7. Dorset, M.; McBryde, C. N., and Niles, W. B.: Bull. 102, Bur. An. Ind., U. S. Dept. Agric., 1908. Dorset, M.: Farmers' Bull. 379, U. S. Dept. Agric., 1909.

8. Duval, C. W., and Couret, M. J.: Read before the Association of American Physicians, May 11, 1916.

ABSTRACT OF DISCUSSION

DR. F. G. NOVY, Ann Arbor, Mich.: Dr. Sewall in his results on the treatment of anaphylactic shock has described a protective action. It seems to me immunity begins with the shock itself. As to the nature of anaphylaxis: We have been accustomed to look on the chemical changes in the body as the most important feature. I am certain that it will be found that these changes are purely physical from beginning to end and that there is no chemistry connected with it.

DR. S. J. MELTZER, New York City: Dr. Sewall is possibly the first one to test the effect of serum not by its action in anaphylactic shock but by its action when it did not kill and later when it protected. He discovered that when subminimal doses were used it was protective. But all such findings must be confirmed before they can be accepted as facts. It is very important to use the serum in small doses by his method. Nobody will object to the use of serum to protect them from infections or against possible anaphylactic shock. It has been found that guinea-pigs may be made either hypersensitive or insensitive to the action of horse serum following the placing of it in the nose and not in the stomach. It might be a good plan to give it by the stomach if the stomach is not full.

DR. HENRY SEWALL, Denver: As to taking the serum by way of the mouth, in a few cases in which I have tried it the results have been negative. The mucous membrane of the mouth absorbs any foreign protein slowly. Again, if it is introduced into the stomach by means of a tube certain errors enter into it and one may lacerate the epithelium.

The Printing Press.—I am the printing press, born of mother earth. My heart is of steel, my limbs are of iron, and my fingers of brass. I sing the songs of the world, the oratorios of history, the symphonies of all time. I am the voice of today, the herald of tomorrow. I weave into the warp of the past the woof of the future. I tell alike the stories of peace and war. I make the human heart beat with passion or tenderness. I stir the pulse of nations, and make brave men do brave deeds, and soldiers die. I inspire the midnight toiler, weary at his loom, to lift his head again and gaze with fearlessness, into the vast beyond, seeking the consolation of a hope eternal. When I speak a myriad of people listen to my voice. The Anglo-Saxon, the Celt, the Hun, the Slav, the Hindu, all comprehend me. I am the tireless clarion of the news. I cry your joys and your sorrows every hour. I fill the dullard's mind with thoughts uplifting. I am light, knowledge, and power. I epitomize the conquests of mind over matter. I am the recorder of all things mankind has achieved. My offspring comes to you in the candle's glow, amid the dim lights of poverty, the splendor of riches; at sunrise, at high noon, and in the waning evening. I am the laughter and tears of the world, and I shall never die until all things return to the immutable dust. I am the printing press.—R. H. Davis.

SIMPLE TIC MECHANISM *

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While the earlier considerations of tic and allied disorders by descriptive neurologists are pictorial rather than interpretative and reportorial rather than explanatory, the French school of neurology (Brissaud, Meige and Feindle) made a valuable contribution toward the better understanding of the mechanism of the disease when it defined tics as "physiologic acts, originally purposeful but which have become acts apparently purposeless and meaningless." It also emphasized the fact that the mental imperfection of the tiquer is characterized by a mental infantilism, for, like most other psychoneurotics, they have the minds of children in regard to their emotional reactions.

Thus, although the French investigators more sharply defined and limited our conceptions of tic, recognized them as psychoneurotic manifestations and detailed their manifold types, they failed to explain why the purpose, subsequently lost, originally took the particular form of expression exhibited in the individual tic, why it varied in each case, and more especially, why the purpose originally expressed by the tic had been lost to the patient's consciousness.

When the Vienna school began the study of neurotic disorders in a psychanalytic way, the mystery of the tic mechanism naturally attracted much attention, and the general view of the freudian school has thus been summed up by Ernest Jones:[1]

> Early in life an exaggerated divorce occurs between the instincts of love and hate, and the conflict between the two dominates the most important reactions of the person. The fundamental state of doubt—an incapacity for decision—results. The patient oscillates between not being able to act (when he wants to) and being obliged to act (as he does not want to). The tic symptom symbolizes the conflict of opposing forces.

L. Pierce Clark[2] has further amplified the understanding of tic mechanism with the analysis of three stubborn cases, in which the malady was interpreted to be an autopleasurable act of sex significance (sex being used in the extremely broad sense with which it is invested by the freudian school). Clark in his reports is inclined to emphasize the auto-erotic gratification unconsciously afforded the tiquer by this act rather than to trace the primary conflict through which the tic developed. The aspect of the tic as a defense reaction is regarded by him as of secondary importance.

If, as Oppenheim[3] states, tics occur most often between the seventh and fifteenth years, and if, as the French school asserts, the tiquer has the emotional attitude of the child, and if, as psychanalysts maintain, the tic of the adult ultimately rests on an unadjusted mental conflict originating early in childhood, it would seem that tics developing in childhood would be more satisfactory to study with a view to determining their original purpose, inasmuch as the purposes of childhood are simpler, more direct and more transparent than those of later years, when primary intentions have become almost unrecognizably altered by the innumerable cross impulses of age.

The simple cases of habit spasm which I am reporting show the tic to be essentially a defense reaction elaborated by the censor against a primarily autopleasurable act. It constitutes, when regarded as an entity, a compromise, just as most other neurotic symptoms are compromises, to retain and at the same time abandon an act which originally yielded satisfaction but which has become intolerable because it cannot be brought to harmonize with the individual's idea of adult or adolescent propriety.

REPORTS OF CASES

CASE 1.—Abe C., aged 10, American born of Russian Jewish parentage, came to my clinic at the Mount Sinai Dispensary suffering from an unusual tic. At irregular intervals he would flex his left forearm on his slightly abducted and elevated upper arm in a jerky movement and then extend it. During the motion the four fingers of his left hand remained tightly clenched, but the thumb of this hand was held rigidly abducted. It was also noted that the thumb was reddened and slightly swollen.

The mother related the following illuminating history: When the child was 1 year old and still suckling at the breast, he contracted diphtheria for which he was sent to the Willard Parker Hospital for Contagious Diseases, where he became infected with the entire category of children's diseases, necessitating a total hospital residence of something over a year.

Following the baby's removal from home, breast feeding was supplanted by the bottle and spoon, but the child evidently found an acceptable substitute for the nipple of which he had been deprived, for when he returned home it was observed that he sucked his thumb incessantly. As the number of children in the family was large and as the baby seemed content and docile when allowed to indulge in his thumb sucking solace, the mother, satisfied in view of her numberless daily household burdens to let well enough alone, made no determined effort to correct the habit.

The censorship of thumb-sucking as being infantile came from another and usually unconsidered source, the child's own playmates. The abnormality was so obvious to them that before long they seized on it as a taunt, and whenever he appeared among them, they greeted him with the cutting nickname, "Abie, the sucker."

While not usually so considered, reprimands from our peers are often more effective than those from our superiors, and in Abie's case, at least, there was an attempt to rectify the habit which had drawn so much odious comment on him. Thus, when the desire arose to regale himself with his favorite pastime, the censorship immediately originated a counter thought to oppose such an action.

The result of this was that the patient started the movement of approximating his extended thumb with a view to inserting it into his mouth, but immediately before it reached its goal, he began to withdraw it, with the peculiar tic resulting. In his tic he thus attains the psychic equivalent of putting his finger into his mouth and at the same time abstains from doing so.

The habit spasm has led to a secondary spinal scoliosis, for the patient had acquired the posture of a mild torticollis through keeping his head tilted slightly downward and to the left, where his mouth would be in position to receive the finger were it not prevented by the counter thought from reaching its destination. The child is neurotic and fretful, but the mother states—and this was verified at the clinic—that both the irritability and the tic cease when he is permitted to isolate himself and insert his thumb in his mouth.

The purposes of children, in contradistinction to those of later years, are transient, unstable, readily diverted and easily displaced. If a 2-year old reaches for cake, the guardian resorts to some such expedient as dangling another object before its eye, and the purpose of obtaining cake is temporarily displaced by a desire to grasp the new object'

* Presented before the New York Neurological Society, April 4, 1916.

1. Jones, Ernest, in White and Jelliffe: Treatment of Mental and Nervous Disease, i, 409.
2. Clark, L. Pierce: Mental Torticollis as a Psycho-Neurosis, Med. Rec., New York, Feb. 28, 1914.
3. Oppenheim: Nervenkrankheiten, Ed. 5, ii, 1448.

So, too, the tics of childhood, representing purposes as they do (that is, compromise defense reactions of the simplest types) are transitory. Like many other ailments, unless the physician acts quickly enough, children's tics may have a disconcerting way of vanishing without the aid of recognized therapeutic measures.

This patient's tic, although studied, was certainly not cured by me. Little Abie's father has relieved the habit spasm by substituting another source of pleasure which is to a large measure replacing his own auto-erotic pleasure. His method, simple enough, consisted in the weekly administration of 10 cents if the child refrains. While superficially the therapeutic effect is striking, naturally the underlying neurotic constitution of the child has not been improved, and it would not surprise me in the least to learn that Abie invests his 10 cents in long sucking stick candy.

CASE 2.—A woman, aged 34, under analysis for a depressive hallucinosis, was remarked to dig her left forefinger repeatedly into the hollow of her cheek. She explained that she often unconsciously did this when under stress and always before going to sleep at night. During the course of the analysis its significance became clear.

As a little girl she constantly sucked her left index finger and continued to up to the age of 8, when her father undertook to break her of the habit by employing the usual punishments, corporeal and psychic. When about 12 years old, she was stricken with a severe febrile disease, which was accompanied by distressing unrest and insomnia. When the family physician complained of the inefficacy of his drugs in controlling her excitement, her father suggested that he knew what would quiet her more quickly than any medicine—namely, permission to suck her finger. The physician did not disdain to accept the hint, which worked miraculously well.

After her convalescence, naturally the habit persisted, and again the father undertook its correction, this time by moral reasoning. During the day she successfully combated the practice, but when alone at night an intense desire possessed her to revert to the infantile means of pacification. Her compromise resulted in putting her finger to the outside of her cheek instead of inside her mouth, and pressing the finger against the cheek instead of the cheek against the finger. Thus she protected herself against violating her father's admonitions and at the same time retained the equivalent of her autopleasurable sensation, in slightly altered form. She unconsciously reverts to this ticlike habit at the present time only to induce sleep or when under some particular strain.[4]

CASE 3.—American, aged 29, under analysis for a claustrophobia, exhibited a tic which consisted in turning the head with a sudden jerk to the right. The patient explained that whenever he found himself in a mental dilemma, the tic arose as a symbolic act to "shake it off."

The autopleasurable origin of the residual movement could be traced to the common practice of children in the country of rolling down hill, the friction and motion of which is undoubtedly a source of gratification. In the case of the patient, even at the age of 8, it was accompanied by a mild sexual erotism when he finally reached the prone position at the end of the rolling, especially when girls mingled with the boys.

The pleasure afforded by hill rolling was supplanted at a somewhat later period (from 8 to 10 years) by the practice of standing in the road and whirling oneself rapidly about until the primary exhilarating giddiness gave way to exhaustion and one fell to the ground. During this form of amusement, one of his companions, the school dunce, discovered that if the neck were craned upward and the head tossed violently in the opposite direction to the whirling before beginning the act, the effect would be more violent and more rapidly induced. Tossing the head thereafter became a regular preliminary to the whirling.

Naturally with advancing years the auto-erotic hill rolling and its successor, body whirling, were discontinued by the children, but the patient, whose psychosexual development remained stationary from the age of puberty, lapsed into another form of auto-erotism, masturbation, with which he struggled incessantly until his neurosis (a compromise affair) developed. His masturbation and sexual maladjustment constituted his urgent difficulty for fifteen years and perhaps, as the patient says, the turning of the head may be a symbolic movement of shaking off his trouble. Possibly there may be some such significance, but it is unquestionable that in attempting to free himself of one auto-erotic habit (masturbation) he unconsciously resumed the remnant of another and earlier one.

In view of Dr. Clark's investigations of habit movements in imbeciles, it is interesting to note that the school dunce, who originated the head turning movement, has since assumed his logical position of the village half-wit, and has retained the habit to such a pathologic extent that he is identified with it.

COMMENT

The mechanisms in these cases are so simple that they may seem superficial. Infantile acts, however, purposes and counter-purposes, are all such. The tics all disappeared, not because of their analysis, but because more vexing problems harassing the patients were solved and the necessity for such supplementary compromise defense reactions no longer existed. The cases are reported, then, to illustrate the theory that these tics originally represented purposes, that the purpose had been suppressed, and how the apparently senseless movement, when resumed, constituted a defense compromise which afforded relief to the patient.

249 West Seventy-Fourth Street.

4. The analysis of other features of Case 2 was reported in the Journal of Abnormal Psychology, February, 1912, and of Case 3, in the New York Medical Record, July 5, 1913.

THE FATIGUE OF ACCOMMODATION

AS REGISTERED BY THE ERGOGRAPH *

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BUFFALO

At the session of the American Medical Association in 1912, I had the honor of presenting a paper which dealt especially with the measurement of fatigue of convergence and of divergence as registered by the ergograph. In another paper in 1913, at the meeting of the American Ophthalmological Society, a classification was given of the varieties of fatigue of convergence.

In this third paper I show that by a similar method the ciliary muscle can also be made to write its story of fatigue. The principle involved has now been worked out sufficiently to venture a description of the method, but the subject has proved to be so vast and apparently so important clinically, that the fatigue of accommodation which accompanies forms of ametropia or of heterophoria must be reserved for future consideration.

It will add to clearness to give first a simple illustration of what is meant by the fatigue of accommodation, after that to describe the apparatus for measuring this fatigue, and finally to show some tracings made by the ciliary muscle, explaining what they mean.

First, to illustrate the principle: If a person who is still young enough to exert some accommodation closes one eye and looks with the other at a printed page, he can approach the page at once to a point where the

* Read before the Section on Ophthalmology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

letters are just visible. But in a few seconds the effort at accommodation is followed by discomfort and blurring; that is to say, it is impossible to keep up extreme tension of the ciliary muscle; and in order to see the letters at all, it is necessary to push the book back to about its original position.

If the experiment is made repeatedly, at each succeeding trial the letters cannot be seen quite as near to the eye as before; in other words, a certain amount of "fatigue" has developed, and this fatigue increases until no further effort of accommodation is possible.

The problem of measuring this fatigue, therefore, resolves itself into three factors:

1. We must obtain test letters or other objects for fixation, which we know demand a definite power of accommodation to make them visible at a definite distance.

2. A simple apparatus must be constructed which will measure exactly at any time the distance of the letters from the eye.

3. Every movement of the letters toward the eye, or away from it, and the time occupied in making that movement, must be accurately recorded. Let us consider these desiderata in detail.

Fig. 1.—Series of characters for testing the accommodation at small fractions of a meter. The letters actually used are photographed, and much more distinct than those shown in the illustration.

The letters are obtained by selecting some of the standard types or numbers which we use clinically, and reducing the size by accurate photographic methods, so that they are equally good tests of vision when viewed at a very near point. An idea of these letters is given by Figure 1. As ink blurs even the larger letters, they cannot be shown on a printed page; therefore those used in these tests have been photographed, although this is not an easy process.

The second desideratum is some arrangement for measuring accurately the distance of the test types, at any time, from the eye. This presents some difficulties when exactness is demanded, but they are overcome best by modifying an instrument which I constructed originally to measure relative accommodation, which is, of course, the amount of accommodation which can be exerted or relaxed with relation to a given degree of convergence. A description of that "optometer" was in my first volume on the muscles, and is shown in Figure 2.

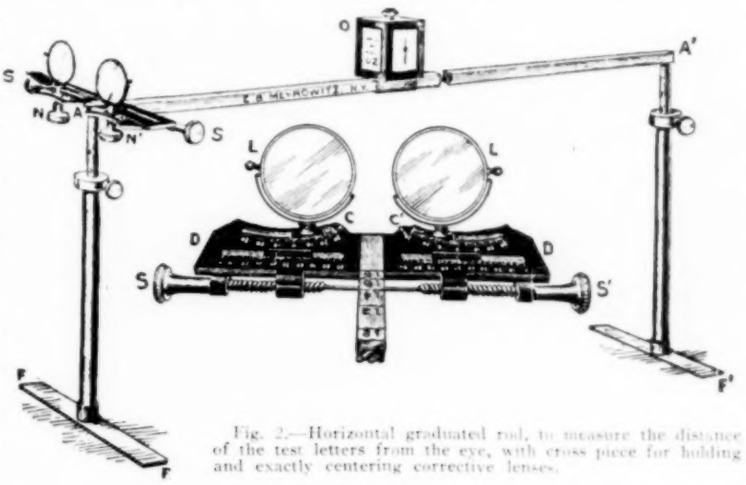

Fig. 2.—Horizontal graduated rod, to measure the distance of the test letters from the eye, with cross piece for holding and exactly centering corrective lenses.

It consists essentially of a properly supported horizontal rod AA', which is graduated in fractions of a meter, measured from the eye. At the proximal end of the horizontal bar there is a cross piece DD, with slots for supporting the lens L or L', as such a lens is necessary in certain cases to correct any existing ametropia.

In order to adapt this instrument to the measurement of fatigue of accommodation, it was only necessary to shorten the horizontal bar and attach to the distal end a small wheel, whose use will be described presently. This modification supplies our second desideratum.

The third desideratum is some arrangement for recording accurately each motion which the test letters make in approaching the eye, or receding from it, and the time occupied by such motion.

Similar records are made in every physiologic laboratory on a drum revolved by clockwork. When it was used originally to record blood pressure it was called a kymograph, but when Mosso used it to record the fatigue of a muscle he called it an ergograph.

When prisms with bases out were adapted to this instrument, it became a convergence ergograph; or if the prisms were turned with their bases toward the nose it became a divergence ergograph, and so on; these have been described.

In order to make this instrument into an accommodation ergograph we must attach near the base of the revolving drum a vertical tube which encloses a brass rod. To the lower end of this vertical rod a spring is made fast to assist in drawing the rod down promptly whenever it has been raised and then quickly released. From the upper end of the vertical rod an arm extends out toward the revolving drum. This arm terminates in a point which will make white tracings on blackened paper, or to which can be attached a pen with ink, if white glazed paper is on the drum. The vertical rod also has attached to its upper extremity a violin string which passes over a groove in the wheel at the end of the horizontal bar already described. The proximal end of the violin string is attached to the support of the test types (Fig. 3).

When the revolving cylinder is thus connected with the graduated horizontal bar which holds the test types, we may call the instrument an "accommodation ergograph." This ergograph was submitted for inspection to Prof. Frederic S. Lee of Columbia University, College of Physicians and Surgeons, who suggested some of its modifications, and to whom acknowledgment should be made for his exhaustive and important work on the entire subject of fatigue.

Let us next consider how this apparatus is used. The patient selected for examination should be young enough to have a certain amount of accommodation. The measurements are satisfactory in proportion to the intelligence of the individual, and also in proportion to the degree in which the refraction of the eye approaches emmetropia. The subject is comfortably seated with his eyes just above the level of the horizontal bar of the instrument, the face almost touching the extended horizontal plate. If he is emmetropic, no glass is necessary. If he is ametropic, of course the

ametropia must be corrected by a proper glass placed in the lens holder *C* or *C'*, and corresponding allowance made for the influence which the glass has on the accommodation. An opaque disk is placed before the other eye.

The degree of accommodation taken as the starting point for the measurement of the fatigue must, of course, be in proportion to the age of the individual.

If the subject is an emmetrope of about 12 or 15 years, the test types can be brought to 20 cm. He then

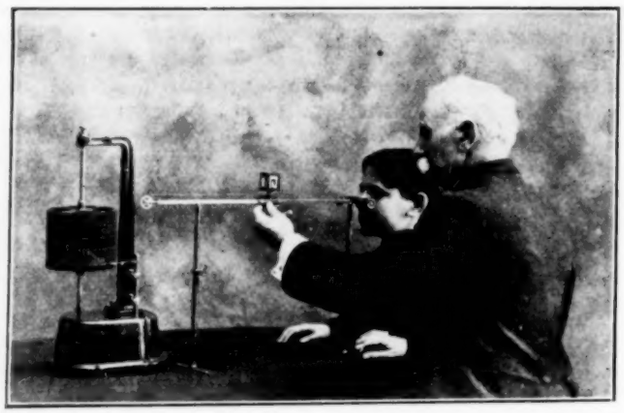

Fig. 3.—Combination of test types, measuring bar and revolving drum which together form the accommodation ergograph.

reads the letters corresponding to that distance, and evidently begins by exerting 5 diopters of accommodation.

If the subject is much older, it is advisable to place the type first about 33 cm. from the eye, and direct him to read the letters corresponding to that distance. Evidently he begins by exerting only 3 diopters of accommodation.

A suitable correction with lenses or selection of type having been made, the subject fixes his attention with one eye on the letters or figures selected as the starting point of the effort of accommodation. As long as he can see that letter he says every few seconds "Yes, yes, yes." Meanwhile the letters are slowly but steadily pushed nearer to him. This approaching of the test letters draws on the violin string which runs over the wheel, and thus lifts the pen which rests on the revolving drum.

As this is done, the subject, under normal conditions, should be able to distinguish smaller and still smaller letters: that is to say, if he begins by reading at 25 cm., the line which corresponds to 4 diopters of accommodation, then when the letters are only 20 cm. from the eye he should be able to read the type corresponding to 5 diopters of accommodation, and so on.

The real fact is that when these small letters are approached to a point where they require a great effort of accommodation for even a few seconds, the ciliary muscle is no longer able to sustain this extreme contraction and suddenly relaxes; the letters blur, the subject sees little or nothing distinctly, and promptly says "No."

The letters are then immediately pushed back to the point of beginning. As they recede, the pen which rests on the revolving drum falls to its first position and there has been recorded on the drum one wave representing one effort of accommodation.

When the test letters are thus pushed away from the eye the ciliary muscle regains its strength. But immediately the experiment begins again. The subject is told to look intently at the line with which he began the first time, and at short intervals to say the word "Yes" as long as the letters are visible. Again the frame with these letters slowly approaches the eye of the subject, drawing the pen upward on the revolving drum as it does so. Suddenly the letters blur, the subject says "No," the letters are again quickly pushed backward, and a second wave or record is made on the revolving drum.

By continuing these tests we find that the muscle of accommodation, like other muscles of the body, becomes less and less capable of exertion, or technically speaking, "it runs down." This is shown on the revolving drum by the series of waves, which grow gradually less and less in their excursions. Indeed, an intelligent patient can measure his or her own fatigue of accommodation, thus eliminating the personal equation of the examiner (Fig. 4). The curved or irregular line which passes from the top of one such excursion to another, uniting all the apexes, has been called the "fatigue curve." In this case, of course, it would be the fatigue curve of accommodation.

The term "fatigue curve" is confusing unless a word of explanation is added. When it was first discovered that the successive contractions of a muscle could be recorded on a revolving drum, the muscle of a frog was ordinarily used in the experiment, and the contractions in the muscle were produced by a current of electricity broken at regular intervals. Under such circumstances the successive contractions were recorded in excursions of the pen which were relatively rapid and regular, and when a line was drawn through the apexes of the excursions, thus registered, it was usually found to be a curve, sometimes convex, sometimes concave to the base line.

A similar fatigue curve can be drawn through the apexes of the registered excursions of the pen when

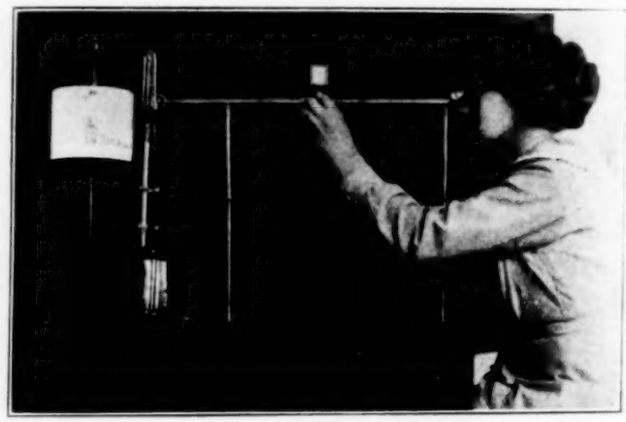

Fig. 4.—Accommodation ergograph. Measurement made by patient, thus eliminating any possible error on the part of an examiner.

with a glovelike attachment on the finger, the contractions of the muscles in the hand are registered. They grow less and less, until further contraction is impossible. But in this case the line connecting the apexes of the excursions is more or less broken.

Now, when we attempt to register on the revolving drum the successive contractions of either the muscles of convergence or the muscles of accommodation, we find that in practice these contractions cannot be made to succeed each other rapidly, or with regularity. The resulting line connecting the apexes of the excursions

is seldom a curve, but broken (Fig. 5) and more or less irregular. In practice it is not necessary to connect the apexes of these recorded excursions, as a glance at the record shows the rapidity with which fatigue has been developed. It is true, a question has arisen as to when we should use the word "fatigue," and when the word "exhaustion" to describe a given condition, and also as to the importance of the nervous system as a variable factor in all these measurements.

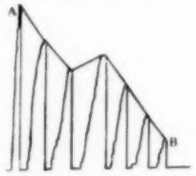

Fig. 5.—The broken line *AB* is the so-called "fatigue curve." This is simply the line which connects the apexes of the different triangular excursions drawn by the pen as it moves on the revolving drum. The fatigue of the ocular muscles is seldom so regular that it can be represented by a curve.

In spite of this, however, the practical fact is that these tracings made by the extra-ocular or intra-ocular muscles do represent, for clinical purposes, at least, their gradual loss of power after successive contractions.

Records of the fatigue of accommodation in the normal eyes are seen in Figures 6 and 7.

The so-called "practical ophthalmologist" may ask of what use these records are. Even if the fatigue of the accommodation can be measured, why should that ever be done? Because we learn in this way whether a strong initial contraction of a muscle really means a strong muscle or the reverse. The ergograph shows us that ocular muscles, like others in the body sometimes, contract two or three times so firmly as to appear quite normal, as measured by tests heretofore at our command, but when that effort is repeated several times in succession we find, to our surprise, that this contractile force is not really strong. It may even be abnormally weak. Certainly, such a fact, which would change the diagnosis, and therefore a plan of treatment, ought to interest even the most practical ophthalmologist.

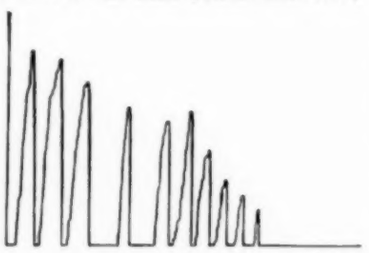

Fig. 6.—An average tracing showing the fatigue of accommodation as registered on the ergograph.

If the limits of a paper like this would permit, it might be interesting to refer briefly to the clinical results of these measurements of fatigue — to show, for example, how the fatigue records vary somewhat in different individuals, the reasons for these variations, and the relation of the fatigue of accommodation and of convergence to each other in emmetropia, and especially how these are influenced by forms of ametropia and heterophoria. But these points must be reserved for subsequent papers.

During the last year the mechanism of the ergograph has been so improved that it is possible to have the muscles of accommodation write their record and the muscles of convergence write theirs, also on the same drum, one record above the other. In other words, we can see at a glance the relations of these two functions to each other. These records suggest the possibility, at least, of solving some of the everyday problems which heretofore have baffled us. It is not too much to expect that this question of the tendency to fatigue or the ability to resist it, on the part of the ocular muscles, may become an important part of every complete examination of the eyes.

ABSTRACT OF DISCUSSION

DR. HIRAM WOODS, Baltimore: In the use of this instrument we are dependent altogether on the answers of the patient. The patient says "yes," "yes," "yes," till he interprets what he sees by a fading out of the print; then he says "no." Now Dr. Howe marks that the punctum proximum. Is that really the punctum proximum? At the meeting of the American Academy of Ophthalmology in Boston Drs. Lancaster and Williams presented a paper on "New Light on the Theory of Accommodation," etc. Among other things which Dr. Lancaster developed was this: If the patient's first point of blur is taken and the eye is kept steadily fixed on that point, a certain amount of accommodation is soon regained, and that punctum proximum can be pushed in quite a little distance. You can try that in your office at any time. Just put on the ordinary measuring rod the point where the patient stops and says the print is blurred and have him look at it steadily for a moment. He will go in 2 or 3 cm. sometimes. It is useful in avoiding the overcorrection of presbyopia. So that the first criticism is whether the test adequately measures the real punctum proximum of accommodation.

DR. G. C. SAVAGE, Nashville, Tenn.: There are two things that we must keep in mind about a muscle—muscle tonicity and muscle contractility. A ciliary muscle with full tonicity will have better contractility than one with less tonicity, under the same nerve impulse. The experiments done by Dr. Howe with this instrument are a little more complicated than at first appears on the surface. There is a center in the brain that calls on the ciliary muscle to do its contracting. That, for want of a better name, we speak of as the tenth conjugate center. It is acting on both eyes whether one is covered or not. It is a neuritic battery. That battery may be strong or weak. It may be able to store a great quantity of neuricity or a small quantity. That battery may be exhausted as easily of its store of neuricity as the muscle is exhaustible of its power of contractility; so that, whenever we resort to this test, we do not know whether we are dealing with a weak neuritic battery or with a muscle in the eye which has small tonicity; or whether it is the reverse, a great neuritic battery in the brain and a great muscle in the eye. Suppose we grant for a moment that it is really muscle fatigue; that is, that the muscle fiber is broken down. What results when muscle contracts? Lactic acid is set free. Following this it imbibes water from the surrounding tissue and the muscle under strong and long contractility becomes waterlogged. I am not able to tell whether it is muscle fatigue or an exhausted battery. There is another complicating feature. The tenth center never acts without exciting the third center, so that it may be the center of convergence that is being exhausted whenever this fatigue is being shown.

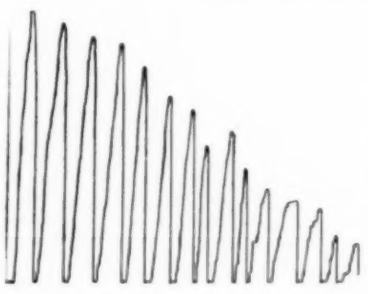

Fig. 7.—Another average tracing showing the fatigue of accommodation as registered on the ergograph.

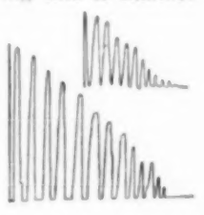

Fig. 8.—Record of fatigue of accommodation (below) and fatigue of convergence (above).

DR. WALTER B. LANCASTER, Boston: Dr. Howe has placed his finger on a very important problem, the problem of fatigue. But whether it concerns ophthalmology, psychology or physiology is one of the difficult problems medicine has to solve. Taking up the experiments of the Italian school, which Dr. Howe says were the basis of his investigation, I would call attention to the important fact that there are two types of curves found on testing the fatigue of the middle finger. When a sufficiently heavy weight is used and the

finger lifts it at sufficiently short intervals we get a curve very similar to the curve given by Dr. Howe, but when a lighter weight is employed and the finger contracts less frequently, we get another type of curve. Under these conditions it may contract indefinitely, there is no falling off from fatigue because the muscle is working within its capacity. Dr. Williams and I tested the accommodation virtually in the manner described by Dr. Howe, except that our apparatus was not self-recording. Thus, moving the object toward the eye and receding, and eliminating certain sources of error, we found, even after keeping it up far longer than Dr. Howe, say 15 to 30 minutes, that there was no falling off, that is, the ciliary muscle was working within its capacity and showed no fatigue, just like the finger with the light weight. We then tried a much more severe test of the accommodation, holding the test object as near the eye as possible without blur and keeping it there continuously at the near point and if possible moving nearer, and we got a third curve. Instead of the muscle weakening and the accommodation falling off, the accommodation increased for 15 to 30 minutes. Thus we found that it is not easy to fatigue the ciliary muscle, and that is practically the testimony of experience. We know that we can read for hours, exercising considerable accommodation. It is because the work of the ciliary muscle is so excessively small when measured or estimated in foot pounds; it only has to relax the zonule. It can do this without showing any falling off from fatigue, but on the contrary an increase. Possibly in myasthenia gravis or other very exceptional condition, one might get curves like those of Dr. Howe but if certain sources of error are eliminated the curve of accommodation will show no fatigue under Dr. Howe's test.

Dr. E. E. Blaauw, Buffalo: At a more advanced age we cannot study through the nearpoint determination the contractility of the ciliary muscle, but only the plasticity of the lens. This prevent us from diagnosticating paralysis of the accommodation, especially of the ciliary muscle in patients older than 60 years. As to the remarks of Dr. Savage about neuricity, etc., I would like to call attention to the investigations of Prof. J. Boeke of Leiden, who has shown that all muscles have a double innervation, one from the cerebrospinal organs and one from the sympathetic system.

Dr. George H. Price, Nashville, Tenn.: In the case of the curve represented by Dr. Lancaster there is a constant and accelerated impulse to the muscle. There is the increased discharge of neuricity as the act is performed. Therefore, if there is continuous stimulation of the same character throughout the impulse, then, since it maintains a perfectly smooth curve, the muscle is the organ at fault when it begins to recede; the muscle grows weaker. But if the curve is not perfectly smooth from its beginning to its end, it shows a variation in the neuricity or impulse. Therefore that would indicate nervous fatigue or failure. In the case of the sustained line, if that line showed a tremulous movement, up and down, then we would have a variable amount of neuricity or nervous impulse being sent to the muscle.

Dr. Lucien Howe, Buffalo: As to the point brought up by Dr. Woods, it is true that the result of the first test would not be exact. We do not depend on doing the test once, but many times. The question asked by Dr. Savage is not one to be answered offhand. I know nothing about neuricity or whether it is the eighth or the tenth center, and the patient does not care. The question is, Is there fatigue? Dr. Lancaster can work with a half pound dumbbell and get that kind of a curve. Physiologists have found the degree of strength that can lift a dumbbell a certain number of times. But it does produce fatigue, simply because the patient cannot lift it again and he knows it. I do not think there is anything very subtle or strange about that. It simply shows how far he can go and after awhile he cannot approach it at all, and we say it is run down. This work was done under the supervision of Prof. Frederic S. Lee of Columbia University, and he is an authority on the question of fatigue. I have simply dealt with accommodation in emmetropia; but now I am studying ammetropia and heterophoria, and the possibilities are enormous. After five years of work it seemed worth while to present the results.

A PRIMARY INTRADURAL TUMOR OF THE OPTIC NERVE

REMOVAL WITH PRESERVATION OF THE BALL*

E. C. ELLETT, M.D.

MEMPHIS, TENN.

History.—L. H., a negro girl, aged 15 years, came to the clinic of the University of Tennessee in November, 1915, complaining that the right eye had protruded for five years and was blind. There was no history of trauma, and the date of the beginning of the protrusion of the eye, as well as of the beginning of the failure of vision, was not definitely ascertained.

Fig. 1.—Appearance of patient before operation.

Examination.—The right eye was prominent and turned inward and upward (Fig. 1). Motion was preserved except outward. The proptosis measured 25 mm. with the exophthalmometer, as compared to 15 mm. in the left eye. The pupil was dilated and fixed and the eye was blind, but the external appearances were normal in every way. There was postneuritic atrophy of the optic nerve and some tortuosity of the veins; otherwise the eyeground was normal. It should be especially noted that there was no attenuation of the vessels. The left eye was normal in every respect. The child's general health was excellent. There was no history of tumors in the family, no abnormality of the nose or accessory sinuses, and no pulsation to be heard or felt. On palpation the finger passed easily into the orbit below and to the outer side of the ball, and a smooth movable mass, about the size of the eyeball, could be felt.

Operation and Result.—A diagnosis of tumor of the optic nerve was made, and operation under general anesthesia performed, November 17. A vertical incision was made through the conjunctiva near the limbus to the outer side of the cornea, and the external rectus muscle exposed and divided. By blunt dissection the tissues were pushed back from the tumor, which was found to be an enlargement of the optic nerve, beginning about 10 mm. back of the globe. The nerve was divided in front of the tumor and the ball displaced upward and inward. All the tissue being separated from the tumor by blunt dissection, an attempt was made to encircle it with a snare, with the idea that it lessened in size as the optic canal was approached and the wire would glide backward to the farthest possible point. As this did not seem to be taking place, the snare was removed and the tumor cut off as far back as possible with curved scissors. It was certain from the inspection of the tumor, and will be equally apparent from the illustration (Fig. 2), that not all of the tumor was removed, but that there was a prolongation into the optic canal, if not into the cranial cavity. The

* Read before the Section on Ophthalmology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

finger introduced into the space left by the tumor did not feel any mass, and the apex of the orbit was in all respects exactly similar to what exists after an ordinary enucleation, this being verified by experienced observers among those present at the operation. The hemorrhage was slight and readily controlled by pressure. The cavity was wiped out with tincture of iodin, the cut ends of the external rectus muscle united, a few sutures put in the conjunctival incision, and a pressure bandage applied. During the operation care was taken to avoid pressure on the eyeball.

The next day there was some discoloration and protrusion from bleeding into the tissues of the orbit, but the lids covered the ball and the cornea was clear. The protrusion subsided in a week, when motion was found to be limited. December 1, the exophthalmometer read 15 mm. in each eye. There was complete paralysis of the muscles supplied by the right third nerve, motion outward being preserved.

December 21, the paralysis was much better.

Jan. 16, 1916, motion and external appearance were as indicated by the illustrations (Figs. 3, 4 and 5).

The changes in the eyeground were very interesting. November 27, there was edema of the whole central region of the retina and a cherry red spot at the macula. The vessels were normal, except that an artery above the macula showed a broken blood current. November 29, the edema was more marked, extending to the nasal side of the disk. Pressure on the eye did not cause pulsation of the vessels, but readily emptied them of blood.

Fig. 2.—The tumor. The large end is the posterior end and shows that complete removal of the tumor was not accomplished.

The Tumor.—The gross appearance of the tumor is shown in Figure 2. It was smooth, tense and cystic to the touch, and measured 3.5 by 2.5 cm. On section, the center was found to be decidedly softer than the periphery, but it was not fluid. There were several small brownish areas, apparently due to capillary hemorrhages. The appearance of the cut surface is shown in Figure 6. Tests for mucin were negative, and did not therefore indicate a myxomatous change. The growth was hardened in alcohol, and cross-sections made of the nerve in front of the growth, longitudinal sections through the nerve and the front part of the growth, longitudinal sections of the posterior part of the growth, and cross-sections about the center. The size of the growth made it undesirable to try to cut it in one piece longitudinally. Sections were stained with hematoxylin-eosin, Van Gieson's stain, Mallory's anilin blue, and phosphotungstic acid hematoxylin.

The whole tumor was surrounded by a dense fibrous capsule, continuous with the dural sheath of the nerve anteriorly. The subdural space could be made out, as well as the pial sheath, and none of these structures showed much departure from the normal. The longitudinal sections of the nerve and anterior portion of the growth showed that not all of the nerve fibers passed into the tumor, but many of them ended at a point where the sheaths made a sort of hour-glass contraction (Fig. 8). Serial sections were not made, so that it cannot be said that all the nerve fibers terminated at this point; but if any persisted, it was as a mere thread. No trace

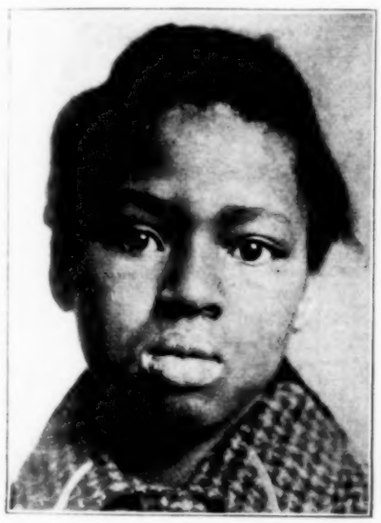

Fig. 3.—Appearance of patient two months after operation.

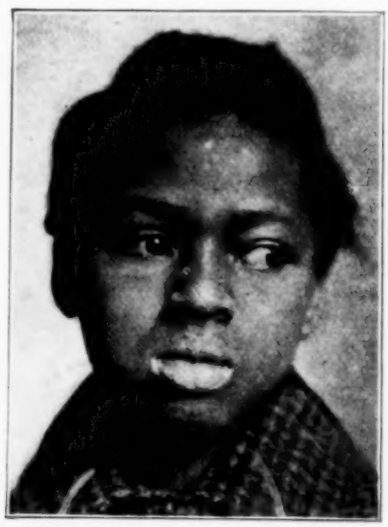

Fig. 4.—Extreme motion to left, two months after operation.

Fig. 5.—Extreme motion to right, two months after operation.

December 21, the edema was gone. In the macular region a few fine white dots and lines were seen. Near the disk, especially upward, was a deposit of black pigment dots on a pale yellowish background. The pigment was also being deposited on the disk, giving an appearance like ashes thickly sprinkled on snow.

Jan. 16, 1916, there was more pigment deposit, almost covering the disk. The vessels were slightly attenuated, especially the arteries.

of the central vessels could be found in the lumen of the hour-glass figure which the dural sheath assumed at this point, which was about 10 mm. behind the globe. It would seem, therefore, that the direct retinal circulation was interfered with before the operation was performed. Back of this hour-glass contraction the dural cavity enlarged rapidly and widely. At first the contents of the cavity were the nerve fibers, slightly altered; but soon a dense infiltration with the tumor cells took place, and the nerve fibers were quickly

replaced by the tissue of the tumor. The farther back one went the more completely did the tissue lose all resemblance to optic nerve, the only part recognizable being the sheaths and connective tissue septa, and a small bundle of tissue, resembling nerve fibers, close to the sheath at one side.

Histologic study of the various sections of different portions of the tumor showed, in the undegenerated and better stained areas, the presence of many spherical cells with well stained spherical nuclei, surrounded by very little cytoplasm. These cells, morphologically, appeared to be glia cells. They were found diffusely scattered throughout the specimen. Interlacing in various directions were fibrils, which according to differential stains (phosphotungstic acid hematoxylin) were neuroglia fibrils. This, however, could not be determined definitely, as the differential stains were not clear, owing perhaps to imperfect fixation. Many vascular channels with large lumina were present. In addition there were present areas of degeneration, and tissue elements, in a state of necrobiosis, the exact histologic structure of which it was impossible to determine.

Fig. 6.—Cut surface of the tumor.

A diagnosis was made of a moderately slow growing glioma, perhaps, better, fibroglioma (the "fibro" here referring to, or indicating, neuroglia fibrils, and not connective tissue fibrils). Owing to the presence of many vascular channels with wide lumina in the specimen, the diagnosis "telangiectatic glioma" may be more accurately applied.

For the histologic study of the specimen, I am indebted to Dr. H. T. Brooks.

COMMENT, AND REVIEW OF LITERATURE

Tumors of the optic nerve are not very common, and it was surprising to me to see three such cases in a single year. One case was reported elsewhere,[1] and in one operation was refused. Still, as Byers has well said, one turns to the literature rather than to personal experience for information on the subject. There are two papers whose scope is such that there is not much else to do but refer to them, namely, Byers' monograph and a paper by Hudson.[2] The latter is the more recent, and in its reports of 210 cases are probably most if not all of those which Byers collected ten years before. He refers to the study of the subject by Lehr[3] in 1877, and thinks the majority of the reported cases are of the type described by Lehr and Willemer:

> The tumors of this type are met with usually in quite young subjects and are of slow and painless growth. Anatomically the new growth is found to lie within the dural sheath, and while it is usually separated from the globe by a short length of uninvolved optic nerve, in many, if not in the majority of cases, it is not limited to the orbital portion of the nerve, but extends into the cranial cavity, more or less extensively. The tumor is in most cases constituted by a sheath portion, lying between the dural and pial sheath, the latter having usually a more or less excentric relation to the former. . . . The tissues of the intervaginal space show often an irregular hypertrophy and an irregular distribution of connective tissue, amongst which the cells peculiar to the tumor lie, while in the nerve portion the tumor tissue occupies the more or less expanded spaces between the connective tissue septa.[4]

A variety of cells enter into the formation of the tumor, four forms being described by Vossius and Salzman. In only one case,[5] has mucin been found, though many of the reported cases showed what looked like myxomatous change.

> In many tumors there is a strong disposition on the part of the tumor tissue to become organized into a more or less compact fibrillated material. . . . Between the two extreme types of tumor thus evolved, various intermediate types are met with, a fact which is probably responsible for the great variety in nomenclature attached to tumors of this class.[6] [See Parsons.]

Fig. 7.—Section of nerve and tumor, × 24. The upper half of the picture represents the nerve. The constriction of the sheath, at which point most of the nerve fibers end, is well shown.

While leaning to the term used by Fischer of "gliomatous degeneration," Hudson would elaborate the name to "degenerative gliomatosis," implying a generalized overgrowth of neuroglia tissue, of infiltrative character, dependent on some degenerative change in the tissues of unknown etiology.[7] Byers speaks of two varieties of tumors, which he describes thus:

> In the first place one had to do with growths the basis of which was essentially an overgrowth of fibrous connective tissue elements of the nerve, but very protean in character, inasmuch as one found every phase of development from the embryonic myxomatous type to firm fibrous bands. The appearances were unquestionably influenced by conditions of stasis in the lymph and venous channels which resulted solely from the local anatomic arrangement of the parts; and altogether the changes suggested those characteristically present in cases of elephantiasis. These findings were in agreement with those of practically every student of the subject as a whole, and can still perhaps be best described

1. Ellett, E. C.: Tr. Am. Acad. Ophth. and Oto-Laryng., 1915.
2. Hudson: Royal London Ophth. Hosp. Rep., 1912, xviii, 317.
3. Lehr: Handbuch der gesamten Augenheilkunde (Graefe-Saemisch), v, 910.
4. Hudson: (Footnote 2), p. 318.
5. Manfredi-Quaglino.
6. Hudson: (Footnote 2), p. 319.
7. Hudson: (Footnote 2), p. 332.
8. Byers, W. G. M.: Tumors of the Optic Nerve, THE JOURNAL A. M. A., July 4, 1914, p. 20.

by the term "fibromatosis," which I used in the title of my first contribution to the subject.

In the second group of neoplasms the changes, varying somewhat in character, were attributable to a proliferation of the local endothelial cells, and the growths were classified as endotheliomas.

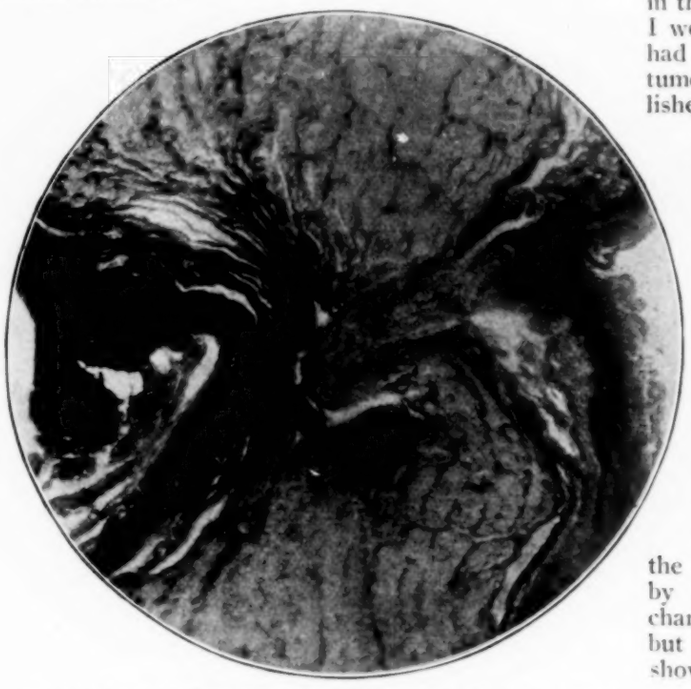

Fig. 8.—Same as Figure 7. × 38. Neither nerve fibers nor vessels pass through the constriction.

Verhoeff[9] thinks that all tumors arising within the stem of the optic nerve are gliomas.

The case here reported presents the features described as characteristic of Byers' second group, while my other case to which I have referred was distinctly of the first group. From this limited experience I would think Byers' idea of the two types is correct, although as stated elsewhere, the hyperplasia in my other cases affected only the neuroglia fibrils.

Of the cases, reports of which were collected by Hudson, 118 are examples of this process. Of these, forty-five cases were observed before the fifth year, twenty-four from the sixth to the tenth, and twenty-nine from the eleventh to the twentieth.

> In no single case has a local recurrence in the orbit been recorded, while cases have been followed without recurrence for twenty-four years. . . . The intracranial condition is in the majority of cases either stationary or so slowly progressive that the patient eventually succumbs to some common ailment.[2]

Since the growth does not tend to invade the ball or the tissues of the orbit, its removal with preservation of the ball, without disturbing the orbital tissues, seems to be advisable. This may be done by the method of Krönlein, with temporary resection of the outer bony wall of the orbit, or by an incision to the outer or inner side of the ball, as suggested by Knapp and others, sometimes combined with canthoplasty, as advocated by Lagrange. From a limited experience I am not impressed with the advantages of the Krönlein operation, and in the comparatively shallow orbit of a child, the operation as carried out in the case herewith reported gave an exposure which left little to be desired.

In explanation of the fact that the vascular changes in the retina after the operation were at first so slight, I would suggest that the central artery of the retina had been gradually occluded by the growth of the tumor and that a collateral circulation had been established at some time prior to the operation. The section of the nerve and some of the vessels on which the retina depended for its nutrition has been followed, first, by the signs of obstruction to the arterial circulation, and later by atrophy of the retina. The pigmentary changes are secondary to degeneration, just as we see in retinitis pigmentosa, although the effect of the traumatism to which the eye was necessarily subjected during the operation may have played some part. On several occasions I have seen very similar pigment changes follow a contusion of the eyeball.

It will be seen that the clinical features of the reported cases were very similar to those presented by the cases which I have seen, and are well described in the quotation from Hudson, given above. Particularly striking is the resemblance between this case and one reported by Arnold Knapp[10] last year. The postoperative changes in the fundus were strikingly similar, but that they may assume another character is shown by a case of Treacher Collins,[11] in which a large white area like dense connective tissue occupied the whole central region of the fundus. At one edge of it could be seen the optic disk, faintly outlined and

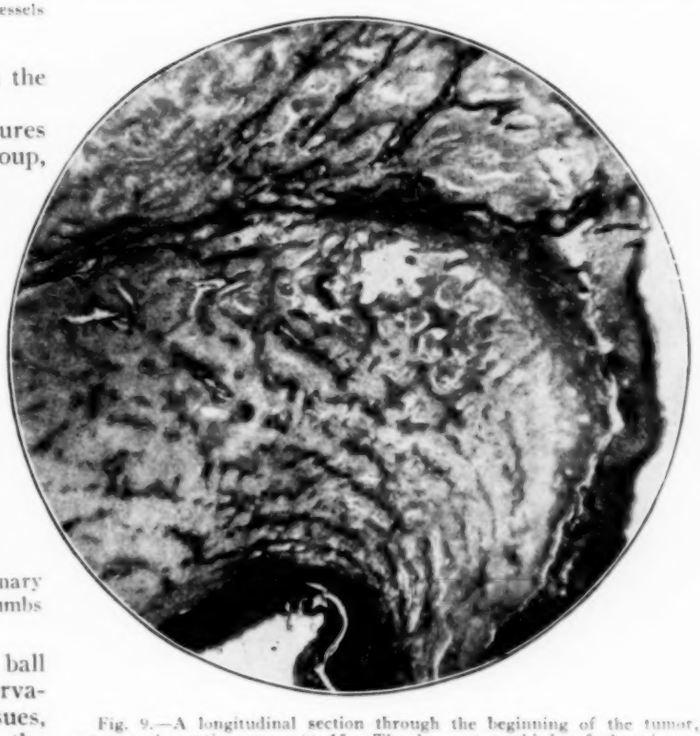

Fig. 9.—A longitudinal section through the beginning of the tumor, nearest the optic nerve, × 15. The lower two thirds of the picture show nerve fibers, the upper third the connective tissue septa, with tumor cells.

9. Personal communication to the author.

10. Knapp, Arnold: Am. Ophth. Soc., 1915.
11. Collins, Treacher: Tr. Ophth. Soc. U. Kingdom, xxxii, 396.

more to be located by the convergence of several branching white lines representing the retinal vessels.[12]

ABSTRACT OF DISCUSSION

Dr. G. E. de Schweinitz, Philadelphia: When Dr. Byers presented his paper I, among others, spoke, as Dr. Ellett has, of the comparative ease with which the area of operation can be reached by the method Dr. Ellett has pursued. Long ago Dr. Hermann Knapp dissected in the manner described. It has been my experience in one or two cases that this form of dissection was facilitated by a canthotomy on the outer side. In regard to whether this or a Krönlein dissection should be performed, I can only say that in a certain number of cases of orbital as well as intradural tumors it has seemed to me that the approach was as satisfactory as it could have been by means of the Krönlein dissection. I am aware that this belief is not shared by some of my colleagues. In regard to the pathology of the three tumors that I have removed, the first was almost pure fibrous tissue. The second was practically identical with the pathologic histology demonstrated by Dr. Ellett, except that there were present certain large cells which the pathologic department of the university believed to be ganglion cells. The third case was interesting because the pathologic histology of the tumor showed it to be a psammosarcoma, with numerous psammoma bodies. Referring to this particular patient, there was a large and rather rapid recurrence in the orbit, so that the orbit was filled with a dense mass which required evisceration, and the histology of the eviscerated portion corresponded with the histology of the primary growth. Therefore, it would seem that occasionally there is orbital recurrence. Dr. Knapp in his presentation of the case to which Dr. Ellett has referred, pointed out that although many years have elapsed the patient is not entirely safe from recurrence. In none of my cases has there been such a recurrence; one of them is of more than eight years' standing. To be quite fair, I must say that I have not removed an intradural tumor of the optic nerve and preserved the eyeball; but Dr. Knapp has done so by the Krönlein dissection on the other eye, making the incision through the conjunctiva. It would seem to be fair first to explore before resorting to the much more formidable procedure, and it would seem, in some circumstances, if not in all, that it is as satisfactory a dissection as the Krönlein.

Dr. Arnold Knapp, New York: I would like to repeat what Dr. de Schweinitz has just said, that we must wait for many years before regarding these cases as entirely benign. The other point I should like to bring out is the change in the retinal circulation after these tumors. The case Dr. Ellett described resembled my own and others described in the literature, in that the retinal circulation continued for some time after the optic nerve and its vessels had been divided. A patient I operated on in 1914 was seen a week ago and there is no sign of any return. The mental condition of the boy is unchanged. There was one change in this case which was very interesting to me, namely that in the macular region a very distinct chorioretinal change has developed; this possibly explains that a good many of the changes in the choroid and retina at the posterior pole of the eye are due to interference with the posterior ciliary blood vessels, because they are not like the slight changes we find in the macula after embolism of the central retinal artery.

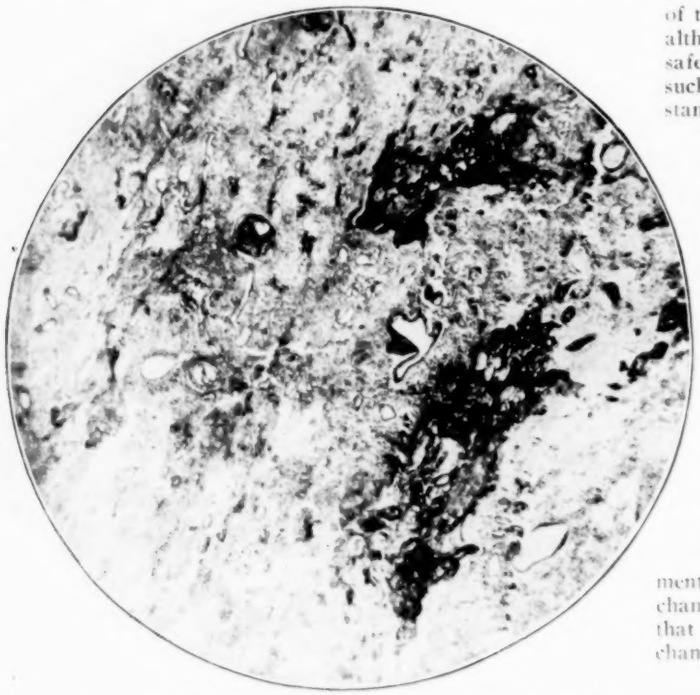

Fig. 10.—A longitudinal section through the posterior half of the tumor, × 15. The arrangement of the tissue elements, the great vascularity, and the connective tissue overgrowth (dark areas) are shown.

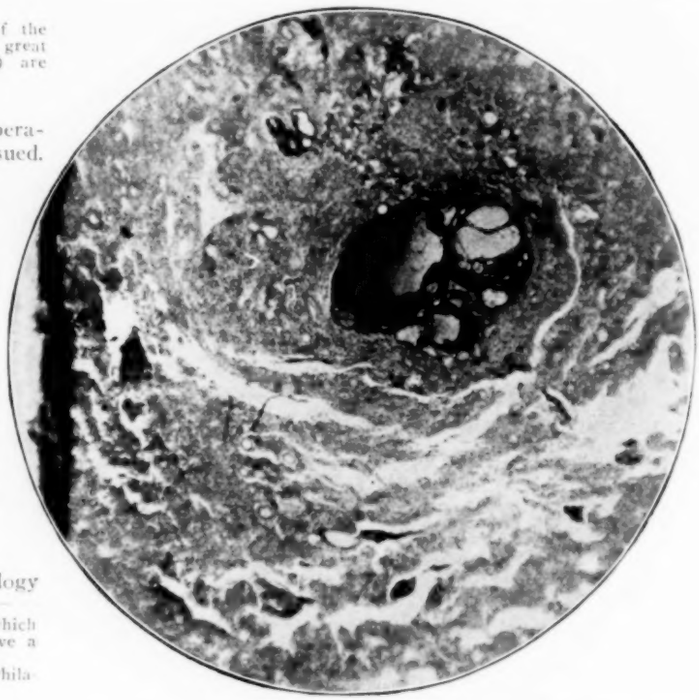

Fig. 11.—Cross-sections of tumor, × 15. One very large blood channel and many smaller ones are shown. In this section the cellular elements predominate, but the magnification is too low to bring them out clearly.

12. The following are some of the contributions to the subject which have appeared since the publication of Hudson's paper, which gave a complete bibliography:
De Schweinitz: Tr. Sec. Ophth., Coll. of Phys. and Surg., Philadelphia, Jan. 18, 1912.
Komoto: Nippon Gankwa Gakukwai Zasshi, February, 1912.
Schirmer: Arch. Ophth., xli, 383.
Astvatzatouroff: Weist. Ophthal., xxiv, 391 (Ann. d'ocul., Brussels, cxlviii, 399).
Kubli: Ztschr. f. Augenh., xxviii, 393.
Sweet: Tr. Am. Ophth. Soc., xiii, 391.
Sattler: Arch. Ophth., xlii, 25.
Sulzer and Rochon: Duvigneaud, Ann. d'ocul., Brussels, cxlix, 161.
Bartotolla: Policlinico, Rome, Jan. 25, 1914.
Eleouskaja: Ztschr. f. Augenh., xxxi, 278.
Zitovski: Weist, Ophtal., xxx, 473 (Arch. d'opht., xxxiv, 518).
Smolianoff: Geneva thesis.
DeLord and Revel: Ann. d'ocul., Brussels, cli, 466.
Knapp: Tr. Am. Ophth. Soc., xiv, 660.
Heed: Tr. Am. Ophth. Soc., xiv, 320.

CONDYLOMA ACUMINATUM OF THE ANAL REGION IN THE MALE *

A. RAVOGLI, M.D.
CINCINNATI

The rarity of the occurrence of condyloma acuminatum in the anal region of the male, as well as the uncertain nosologic place of these papillary acanthomas in syphilology, has prompted me to report two cases of them which recently occurred in my hospital service. Many physicians are not clear whether condyloma acuminatum is to be considered as the result of syphilitic infection, or whether it must be considered as a vegetating papillary growth independent of syphilis.

In a general way it can be stated that condyloma acuminatum is only a venereal wart, and these growths are so called because they grow around the genitals, and are preceded or associated with venereal diseases. They come on mucous membranes and on the skin moistened, macerated and irritated by abnormal purulent secretions. In ordinary cases condylomas grow as discrete excrescences. In some cases, as in mine, they become confluent and coalesce, forming large masses of cauliflower appearance. They are rarely dry, and are usually moist, according to the region they occupy. In a general way they are found together with venereal diseases. There is also a belief in the possibility that they may grow on skin or mucous membranes exposed to long irritation, to purulent discharge, independently of venereal cause.

Fig. 1.—Condyloma acuminatum of anal region (Case 1).

The irritation produced by the gonorrheal secretion in a balanoposthitis or vaginitis, when cleanliness is neglected, is sufficient to inflame the skin or the mucosa, cause excoriations, and denude the papillae, which under the constant irritation grow as papillary vegetations.

Stumpke[1] and Klingmüller described vegetations developing from gonorrhea around the female genitalia and the anus. In my experience the same vegetations are found in the mucous membranes which have been the seat of irritation from chancroidal infection. In the same way, when the skin or mucous membrane has been affected with mucous patches, these have been misnamed condylomata lata, assuming, according to circumstances of locality, different degrees of growth.

The mucous patches which are nothing else than syphilitic papules, the true exponent of the secondary manifestations of syphilis, show a different appearance according to the regions of the skin of the body. The dry papule occurs on the surface of the skin, and so remains until involution, which causes desquamation of the epidermis, owing to its location.

On the contrary, when the papules are seated on the mucous membranes or on the adjoining skin, they are constantly moist with a mucopurulent discharge of their own, or with urine or fecal matters, or with constant perspiration, and become moist papules, papula humida, mucous patches. The epidermis is consequently macerated, cast off, excoriated, the surface is covered with necrotic detritus, and the papillary layer is exposed in the center of the papule, and begins to proliferate in the form of small granulations, which give to the mucous patch the name of hypertrophic papule.

I must mention that in cases of phimosis from the accumulation of the smegma, balanitis may arise, and give origin to warts which have no specific nature.

The name condyloma acuminatum serves well to represent all those vegetations due to papillary growths, acanthoma papillare, while condyloma latum stands for syphilitic mucous patches. It may be misleading, however, and is apt to give a wrong idea as to the entity of the disease.

It would be much better to drop the name of condyloma latum as useless, and retain that of condyloma acuminatum, to designate vegetations, granulations and warts of nonspecific nature, which, being seated on the genitals, and being preceded or associated with venereal diseases, have taken the name of venereal warts.

REPORT OF CASES

CASE 1.—A man, aged 20, white, baker, of good general physical constitution, had always enjoyed good health. Two years previous to the present affection he had syphilis. He was treated with repeated injections of salvarsan until the Wassermann reaction was negative. During the early secondary manifestations, mucous patches around the anus had been the most persistent symptom. Six months later small warts began to grow at the anal rim between the mucous membrane and the skin. Other warty vegetations grew around the perianal region, and in about six months' time they had grown to a large vegetating mass, to fill up the entire intragluteal region.

When he was admitted to the venereal service, he showed the anal and perianal region filled up by a mass of papillomatous vegetations, confluent, from 1 to 1½ inches long, which was protruding out of the buttocks, of cauliflower appearance. Of the papillomatous excrescences some were sessile, attached to the base, while others were pedunculated, and attached to the others by the end-point. They were soft to the touch, and of a red cyanotic hue. Most were implanted at the edge of the anus; some were scattered on the perianal region.

The patient could no longer walk on account of the growth being tender and painful. The mass, as shown in Figure 1, had filled up the whole anal and perianal region from the coccyx to the perineum. The mass was rather soft to the touch, tender, and did not cause serious obstruction to the expulsion of the feces. An exploring finger could be introduced into the rectum without difficulty, showing that the anus was not strictured, and removing any suspicion of possible epitheliomatous nature. The Wassermann test was negative, and no symptoms of active syphilis could be found. Some secretion from the rectum was examined for gonococci, but the result was negative.

CASE 2.—A negro boy, aged 22, showed the same kind of vegetations around the anus. He had suffered syphilis for nearly two years. Has been treated intermittently with mercury, mostly by the mouth. The Wassermann reaction was strongly positive. The mass of vegetation around the anus

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Stumpke: Ueber gonorrhoische Granulationen, München. med. Wchnschr., 1914, No. 28; ref., Gior. ital. d. mal. ven., 1914.

was so tender and painful as to compel him to ask for medical attention.

Treatment.—In both cases the treatment was surgical. Under general anesthesia the whole mass was firmly taken with a piece of gauze in the left hand and drawn by the opposite side. With a semicircular incision with a bistoury half of the vegetations were removed at their base, and this was repeated on the other side, the whole mass being cut off. In a moment the surface was clear. The blood was easily stopped. Other small condylomas in the perianal region were clipped off with the scissors, and touched up with solution of ferric chlorid to stop the bleeding. The mucous membrane of the rectum was sewed together with the skin. The only dressing was dry mercuric chlorid gauze. After ten days the recovery was perfect. Both patients were able to leave the hospital recovered.

Pathology.—One of the vegetations was hardened in 4 per cent. formaldehyd solution, and then in alcohol, cut in sections, and stained with hematoxylin and eosin.

The specimen under a low power shows a thick epidermis, a true acanthosis. The horny layer is thick, and is easily detached from the other layers, and the cells are not keratinized to form a strong protection. The mucous layer is thick, enlarged, made up of large epidermic cells of the prickle type. They do not show difference between the granular and the basal layer. The epidermis is adjusted on the elongated papillae, separating and covering each division of the papilla without causing any compression.

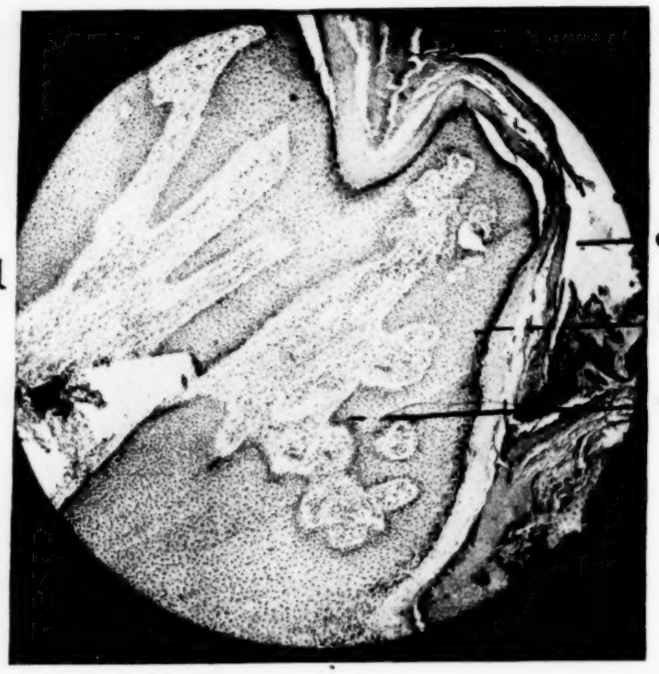

Fig. 2.—Section of specimen: *a*, horny layer partially detached; *b*, increased granular and basal layer; *c*, vegetating papillae; *d*, infiltrating elements between connective tissues.

The papillae, greatly enlarged, are divided at their end into small thin sprigs. They are formed by connective tissue fibers, which are greatly increased in quantity and in size, infiltrated with small cells. Each growing papilla contains blood and lymph vessels. The capillaries which enter in the enlarged papillae have the caliber of cutaneous veins, and in some of the papillae the veins are dilated in the form of varicosities. Between the fibers forming the papillae there are lymph spaces, which are filled with fibrin granules. Leukocytes and mast cells are found in the newly formed connective tissues. The proliferating process is remarkable. It can take large proportions, by the dichotomic scission of the end of the papillae, through a chronic hyperplastic inflammatory process. The great enlargement of the blood vessels, the congestion, and the effused lymph between the tissues is the cause of the swelling of the connective tissues, and of the increase of the epidermic layers. It seems that the effusion of the lymphocytes between the connective tissue elements produces the proliferation and the increase of the growth. The papillae do not grow in one direction, but extend on all sides in the form of a fan. On account of the enlargement of the veins at the end of the growth, they take the appearance of a mushroom or of a pear. From this irregular process of side growths results the cauliflower appearance of the condylomatous mass.

COMMENT

In both cases it can be said, first, that the condyloma has had its origin on the skin and on the mucous membrane injured by syphilis, and, secondly, that the constant presence of the normal and abnormal secretions, and lack of cleanliness have caused the proliferating acanthosis. The syphilitic base, however, is only accidental, and not necessary for the production of the condyloma. On a mucous membrane or on the delicate skin of the genitals, excoriated from the irritating secretion of the gonorrhea, or an excoriated surface left so by the presence of chancroids, papillary hypertrophy may develop with formation of condylomatous growths.

In the early period of syphilis the patient suffers with an obstinate eruption of the mucous patches of the anal region, and it is possible that the blood vessels of the area have remained affected by the syphilitic process. The stasis and the enlargement of the hemorrhoidal veins have great influence in the production of the condyloma, as they show a deep, intense red, livid or bluish color.

It is easily understood that neither salvarsan nor mercurial treatment has any action on these condylomas, as they are only local proliferations and are not produced by the syphilitic process. The mast cells, the infiltrated collagenous tissues and the dilated blood vessels are not affected by the treatment, as they are of nonsyphilitic nature, and are subject only to regressive changes.

Therefore they cannot be considered as a form of vegetating syphilid. Syphilis vegetans or framboesiformis belongs to a tertiary form of syphilis, entirely different clinically and pathologically.

Tryb[2] illustrated a case of the same kind of papillary growths of the upper lip, in an old syphilitic which, however, had no syphilitic base. In the same way in my cases, the condylomas, although vegetating on tissues irritated and injured by the presence of syphilitic papules, the papule has healed up, and the condylomas had nothing characteristic of the vegetating syphilitic form.

They belong to that class of condylomas which are implanted on tissues which have been the seat of syphilitic manifestations, but they are not the result of the syphilitic process. The perianal region has always a tendency to abundant perspiration, which moistens the skin and the fecal matters which from lack of care may remain, macerating the epidermis, and the exposed papillae of the derma under so constant an irritation may begin to vegetate and show up in the form of warts.

In the cases in which the acanthosis has a syphilitic base, vegetating syphilid, the growths are produced on

2. Tryb: Ueber eine seltene Form von Acanthoma papillare auf luetischer Basis, Dermat. Wchnschr., 1913, lvii, 819.

a base hard and infiltrated, diffuse gummous infiltration, and in this case very likely the presence of the spirochete is capable of causing vegetation. When the syphilitic infiltration has been removed through local antisyphilitic applications, the proliferations also gradually disappear.

In the case of condyloma, on the contrary, no application stops the growth of the tumors, and they grow and multiply to the point at which the patient cannot walk and is compelled to ask for medical help. The histopathologic features are also entirely different from those shown by a vegetating syphilid. In condyloma acuminatum we have seen the whole process to consist in a chronic inflammation of the papillae of the skin and of the mucous membrane, with congestion and occlusion of the blood vessels. In condyloma the process of proliferation does not undergo regressive changes as in the syphilitic tissues, but remains or continues to grow.

The epidermis in the skin or the epithelium in the mucosa excoriated by the destructive and irritating action of a chancroidal ulcer, or by the constant presence of the gonorrheal secretion or by the action of the syphilitic virus in mucous patches, leaves the papillae denuded, and exposed to the irritant action of the excretions and of external irritations. The irritated papillae begin to proliferate, forming acanthoma. As stated in the beginning, in the cases of long standing sinuses, we see papillary vegetations on the skin which has been exposed to the irritant action of the purulent matter.

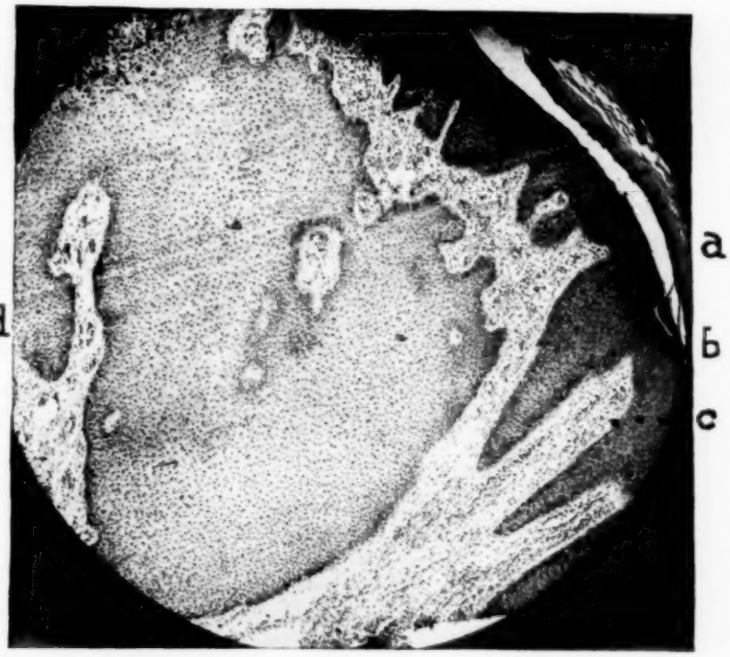

Fig. 3.—Section of specimen: *a*, horny layer partially detached; *b*, increased granular and basal layer; *c*, vegetating papillae; *d*, infiltrating elements between connective tissues.

The frequent occurrence of condyloma acuminatum on syphilitic patches was long ago pointed out by Wertheim,[3] and he himself separated this kind of condyloma acuminatum from the syphilitic process.

Antisyphiltic treatment has no effect whatever on condyloma acuminatum, and its treatment rests entirely on the destruction and removal of the papillary growths. Their size, shape and quantity will determine the method of removal. In my practice I frequently use the sharp dermal curet to scrape the growth from its roots. Then I touch the bleeding wound with solution of ferric chlorid. When the condylomas are long and pedunculated, it is better to snip them off with a pair of curved scissors. In ordinary cases, local anesthesia with ethyl chlorid is enough to give a chance to scrape the condyloma. The repeated freezing of small condylomas with ethyl chlorid has been praised as a curative method by Schein,[4] but I prefer to rely more on the action of the sharp curet.

In the two cases reported, on account of the large size of the mass of tumors, there was nothing better to do than remove the whole mass, as advocated by Morris[5] and Markoe,[6] which gave in both cases the most satisfactory results.

Condyloma acuminatum is a purely benign growth and is to be entirely distinguished from condyloma latum, which is a syphilitic manifestation.

General specific treatment has no action on condyloma acuminatum, and the recovery is to be obtained only by surgical treatment.

5 Garfield Place.

ABSTRACT OF DISCUSSION

DR. PHILIP KILROY, Springfield, Mass.: I wish to mention a fact that we are apt to overlook, and that is the importance of the anal region in the diagnosis of syphilis. When I fail to find any evidence of a cutaneous nature on any other part of the body in suspected cases of syphilis, I can usually find it in the anal region. I was interested in the suggestion made by Dr. Ravogli attributing the presence of condyloma acuminatum in the anal region to uncleanliness, perspiration, etc.

DR. WILLIAM A. PUSEY, Chicago: Dr. Ravogli has performed a useful function in emphasizing the fact that condyloma acuminatum in the anal region is nonsyphilitic. I would simply regard it as a vegetating dermatitis, such as may occur from low grade inflammations of various sorts. As to the treatment, I can confirm the assertion that surgical removal is the most efficient as well as the most rapid method.

DR. WILLIAM T. CORLETT, Cleveland: The severity of these cases varies somewhat in different climates. They are often ascribed to a syphilitic basis, but I do not know on what authority. I have seen several cases which were cured by simply dusting the lesions with calomel, which often gives good results, particularly in one case, a woman who objected to the odor of iodoform. I agree with Dr. Ravogli that the lesions are produced by moisture, heat and filth, causing local irritation, with secondary infection. In South America, I believe, the condition is very common in the inguinal regions.

DR. A. RAVOGLI, Cincinnati: Dr. Kilroy is correct that the cutaneous manifestations of syphilis are often found about the anus. I also agree with Dr. Pusey that in condyloma acuminatum we have to deal with a vegetating dermatitis of a low grade, a nonsyphilitic process. In my experience with these cases, calomel has not given me very good results. In the smaller condylomas a strong resorcin and salicylic acid ointment is satisfactory when patients object to iodoform.

3. Wertheim: Zur Koinzidenz von Syphilis mit spitzen Kondylomen, München. med. Wchnschr., quoted by Tryb: Dermat. Wchnschr., 1913, lvii, 826.

4. Schein: Wien. klin. Wchnschr., xviii, No. 5; quoted by Morris, C. C.: Gonorrhea in Women, Philadelphia, 1913, p. 199.

5. Morris, C. C.: Gonorrhea in Women, Philadelphia, 1913, p. 200.

6. Markoe, J. W.: Bull. Lying-In Hosp., New York, 1912, viii, 113 (quoted by Morris).

THE DESIRABILITY OF USING MIOTICS AS ADJUVANTS TO MYDRIATICS*

HAROLD GIFFORD, M.D.
OMAHA

That homatropin may very exceptionally cause glaucoma has long been known, but a total of eleven cases of glaucoma, out of the millions in which homatropin has been used during the last thirty-five years, certainly would not indicate any great danger in its use; and although many cases have doubtless gone unrecorded, even my own exceptional experience would not indicate that it occurs in more than, approximately, one in 10,000 cases. This does not constitute any serious indictment of the use of cycloplegics and mydriatics for refraction and ophthalmoscopic work; even if there were no way of preventing the danger, we should accept it as we do the danger of quinin amblyopia or salvarsan encephalitis, in the interest of the greatest good; but, luckily, we have an almost certain preventive.

Some years ago I[1] reported the following case of glaucoma caused by the use of homatropin:

Case 1.—A woman, aged 21, had 4 diopters of hyperopia. The eyes began to pain her from eight to ten hours after a homatropin test, but I was not called until the second day, when I found both eyes to be nearly blind from acute glaucoma, which was relieved within three hours by a solution of pilocarpin and cocain (2 grains of the former and 1 grain of the latter to the dram, 1 drop every half hour for three hours), but the first examination of the fundus, which was made two days later, showed numerous hemorrhages in the center of each retina; and although one eye regained normal vision, the other never improved beyond $^{20}/_{70}$, and showed a tendency to glaucoma which required the use of eserin (physostigmin) as long as she was under observation.

In reporting this case, I laid stress on three points: 1. If this patient had lived in some remote locality, she might easily have lost the sight of one or both eyes. 2. The retinal hemorrhages, which permanently damaged one eye in this case might *possibly* have been avoided, if I had taken more time to reduce the tension. 3. To prevent such occurrences, the use of homatropin should always be followed by eserin even in comparatively young patients.

Since then I have had four more cases of homatropin glaucoma:

Case 2.—A woman of about 30, while in my office, being tested under homatropin, developed acute glaucoma in the left eye with marked hypertension and a sharp arterial pulse.

Case 3.—A woman, aged 65, had a single drop of 4 per cent. homatropin in the left eye, for the examination of fine changes at the macula. As near as I could learn, she received the regular dose of eserin, but in spite of this, she developed an acute glaucoma in the left eye during the same evening. In both these cases the glaucoma yielded promptly and permanently to eserin (physostigmin).

Case 4.—Another patient was not so fortunate. She was a woman of 44 years, who came at a time when several years of immunity had so dulled the edge of my anxiety that I had permitted the rule to give out-of-town patients eserin to use at home gradually to fall into disuse. She received a homatropin refraction test of both eyes, followed by 2 or 3 drops of eserin (1 grain to the ounce). She then went to her home about 150 miles distant, and after about a month, some friend wrote me that the sight of the right eye had never come back. I advised her to return at once, but neither saw nor heard anything more of her for about two years, when she stopped in and I found the right eye to be entirely blind, with tension plus 2, dilated pupil, shallow chamber and excavated disk. It was quiet and had never given any pain to speak of. The left eye was normal.

Since then I have tried strictly to enforce the rule to give a vial of eserin solution to out-of-town patients and have had no further trouble of the same sort with them. This rule, however, is not entirely fool and accident proof. Some patients lose the bottle or spill its contents, and occasionally, in spite of all precautions, a patient gets away without any eserin.

This is what happened in my fifth and, it is to be hoped, my last case:

Case 5.—A woman, aged 69, had slight lens and vitreous opacities in each eye. R. E. V. = $^{20}/_{20}$ L. E. V. = $^{20}/_{70}$. L. E. turned in a little and had been slightly amblyopic since childhood. She was given a drop of homatropin, 4 per cent., in each eye for ophthalmoscopic purposes. Through a misapprehension, when she was ready to leave, the office girl gave her eserin in the *right* eye only. That night the *left* eye became painful and she felt so bad generally that although she did not think it worth while to report to me, she stayed in bed for a week. She then returned with the right eye normal, but the left eye had marked glaucoma with V = light perception only, tonometer R. E. 20 mm. L. E. 60 mm. Eserin did no good, and the next day an iridectomy, preceded by a posterior sclerotomy, was done; but her vision improved only to fingers at 6 feet, with T. 51 mm.

We are often tempted to complain of the too anxious patient; but the too trusting kind, of which Cases 4 and 5 were such striking examples, is much more dangerous.

When I reported my first case of homatropin glaucoma, only two others had been reported, that of Sachs,[2] in which a man of 58 received a single drop of 1 per cent. homatropin for ophthalmoscopic purposes, and that of Shears,[3] whose patient was a woman of 52, who received homatropin in one eye for a refraction test. Since then I have found reports of four more cases beside my own: Friedmann,[4] for a refraction test, put 3 drops of a 1 per cent. solution of homatropin into each eye of a woman, aged 37. That night glaucoma developed in the left eye only, and as it failed to yield to myotics, an iridectomy was done several days later, with some improvement. This woman gave a history of going blind in the same eye three days after a similar test, three years before, but as she had recovered completely in a few days, and the eye seemed perfectly normal, Friedmann felt justified in using homatropin.

In the discussion of Friedmann's case, Strickler[5] mentioned a similar case in a woman, aged 30; and Stevens,[6] still another in a patient (male or female?), aged 30 years.

Edgar Stevenson[7] gave a man, aged 24, a couple of drops of homatropin solution, 4 grains to the ounce, on account of irritation following the removal of a foreign body from the cornea. Acute glaucoma developed in the affected eye the next day.

In six of these eleven cases (Shears, Strickler, Stevens, Stevenson and two of mine), a prompt and complete cure was obtained by the use of a myotic.

* Read before the Section on Ophthalmology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Gifford, Harold: Ophth. Rec., 1900, p. 328.
2. Sachs: Centralbl. f. Augenh., 1884, p. 499.
3. Shears: Ophth. Rec., 1900, p. 150.
4. Friedmann: Ophth. Rec., 1908, p. 92.
5. Strickler: Ophth. Rec., 1908, p. 93.
6. Stevens: Ophth. Rec., 1908, p. 94.
7. Stevenson, Edgar: Ophthalmoscope, 1913, p. 73.

In one of my patients, the myotic cure was complete in one eye and incomplete in the other; in another, an iridectomy produced some improvement, but the eye was of little use. In one case (Shears) an iridectomy was necessary with perfect result. In one case (Friedmann) an iridectomy was necessary with improvement. In one case (my fourth), without treatment, total blindness in one eye resulted.

Shears, in reporting his case, recommended that when homatropin was used, eserin should be instilled "before the patient leaves the hospital." In my first report, I made the further suggestion that out-of-town patients should take eserin with them for use the next day; a rule, the importance of which is indicated by the deplorable result in my fourth case, in which it was neglected.

My present plan is this: Each homatropin patient (except young children), whether the drug has been used for refraction or for ophthalmoscopic work, beside having the eserin instilled before leaving the office, receives from 10 to 15 drops of eserin solution, 1 grain to the ounce, in a small vial with a partly attached label on which is printed the following:

> Put 1 drop into eye with butt end of match or tooth pick tonight at suppertime and bedtime; after today, 1 drop three times a day until pupil of eye and sight for near things gets same as before test. If necessary to refill, have druggist put in solution of eserin sulphate, 1 grain to ounce.

A match is recommended rather than a dropper, because it is less apt to waste the solution. The importance of using the eserin the same night is indicated by the fact that in several cases the trouble has begun at that time, in one case even when physostigmin had been used in the afternoon. The reason for the indeterminate period of use is that the time required for the homatropin effect to wear off varies considerably. In a case reported by de Schweinitz,[8] the effect lasted five days. Why my own experience with homatropin has been so unusual I cannot say. For a refraction test I generally use 1 drop of a 4 per cent. solution four times in the course of an hour. This strength is not unusual so far as I can learn; but that the intensity or, at least, the duration of the homatropin effect has something to do with the danger is indicated by the fact that while in four cases glaucoma resulted from a single application, these patients, with one exception, were over 55 years of age; while of the seven who received homatropin for a refraction test, all but two were under 40. In other words, the use of a single drop of a mydriatic solution carries very slight danger except after the age of predisposition to glaucoma has been reached. Hence, for ophthalmoscopic work, the weakest solution that will widen the pupil enough is the best. Whether for this purpose euphthalmin or cocain is as serviceable as a 0.5 per cent. solution of homatropin I doubt.

Of course there is nothing about homatropin glaucoma that is essentially different from any mydriatic glaucoma, such as has been observed a number of times after atropin and cocain; also after duboisin,[9] scopolamin,[10] euphthalmin,[11] epinephrin,[12] and even holocain[13]; and the fact that since the introduction of homatropin more cases of glaucoma have been reported from it than from atropin is, aside from its freer use probably because glaucoma from atropin once having been established as a thing to be looked out for, it has not been thought worth while to report it. It follows that when any mydriatic is used for temporary effect, it should, except in early childhood, be followed by some myotic. I must admit that after using cocain for foreign bodies or in lacrimal cases I generally think it enough to instill 2 or 3 drops of eserin before the patient leaves; and, when only a little cocain is used, before a lid application, for instance, I use nothing at all to neutralize it. The mydriatic effect of holocain and epinephrin is usually so slight that it can be neglected. I generally exclude young children from attempts to neutralize mydriatics, both because the danger is probably absent and because they put up such a fight. With this exception, although the youngest patient so far reported was a woman of 21, I have not felt like drawing an age line on the prophylactic use of eserin.

It is worth noting that of the eleven cases of homatropin glaucoma, the patients were women in eight cases.

8. De Schweinitz: Nagel-Michel's Jahresb., 1890, p. 129.
9. Heyl: Nagel-Michel's Jahresb., 1882, p. 412.
10. Treutler: Nagel-Michel's Jahresb., 1905, p. 618.
11. Knapp, Ring: Nagel-Michel's Jahresb., 1903, p. 651.
12. McCallan: Nagel-Michel's Jahresb., 1903, p. 651.
13. Plastinin: Klin. Monatsblt. f. Augenh., June, 1914, p. 896.

CONCLUSIONS

Glaucoma from homatropin or other mydriatics, whether used for refraction or ophthalmoscopic work, is a slight but real danger. It is almost entirely preventable, and for this purpose an eserin solution not only should be instilled immediately after the examination, but also should be given to the patient to use at home until the effect of the mydriatic is gone.

I know that eserin, in some form, is now generally used after homatropin refraction tests, but I have a decided impression that it is not used so often or so thoroughly as it should be.

Brandeis Block

ABSTRACT OF DISCUSSION

DR. EUGENE SMITH, Detroit: I do not appreciate any particular difference between homatropin and the other mydriatics in the production of glaucoma. I have seen several cases resulting from the use of other mydriatics. The only point I can see is the frequency, perhaps, of the use of homatropin and the infrequency of the occurrence of glaucoma in that connection. Most of us are more or less conversant with the various theories of glaucoma, and the paper does not call for extensive discussion of these theories; still it is necessary to consider a proper *raison d'être*. I am inclined to think that a vasomotor disturbance plays an important part in the matter under consideration. In the few cases I have seen considerable turgescence following very shortly after the application of the mydriatic. It can readily be understood that presupposing a small circumlental space and a blocking of the filtration angle a glaucomatous condition might develop. Experience suggests some general rules which may ward off or control the condition and check it permanently. No doubt it would be well to assume a possibility of its occurrence in all hyperopic eyes and follow the suggestion of the author to use eserin in all cases after the use of a mydriatic, in young adults as well as in middle age. The first observations with regard to mydriatics producing glaucoma were made by Haskett Derby of Boston, I think in 1866 or 1868, so that America deserves the credit for calling the attention of the profession to this extremely important subject.

DR. CHARLES MAY, New York: I have used 2 per cent. of homatropin in combination with 1 per cent. cocain for the purpose of estimating errors of refraction for twenty or twenty-five years. I have invariably used eserin in 0.5 per cent. after each examination. I do not consider it entirely fair to allow a patient to leave the office after the pupils have been dilated with homatropin without using eserin,

subjecting them to discomfort for thirty-six or forty-eight hours when it is possible to make them comfortable in a little while with the instillation of eserin. I have performed as many of these examinations under homatropin as any man and I have never had a glaucoma result. My plan is to instil such a solution in four doses at intervals of three minutes, wait one hour, undertake the examination, and then put in 1 drop of 0.5 per cent. solution of eserin and follow that in three minutes with a second drop. I tell the patients they will have a great deal of uncomfortable twitching of the lids for a while. I have never had any unfortunate results. Perhaps the reason I have never had trouble is because I am careful of the homatropin I use, and I make all my own solutions. In some cases in which glaucoma has resulted we cannot be sure, if the oculist has not put up his own solutions, that he has not been using atropin. In the second place, if he allows a nurse to put in the drops, how does he know she has not used atropin. I never allow a nurse to put drops in a patient's eye without first showing me the bottle. I am surprised that everybody does not use eserin after homatropin, even in children. It is so easy, so successful, so universally dependable, that in an hour the patient has lost the inconveniences of homatropin, and I believe has gotten rid of all dangers.

Dr. W. W. Kahn, Detroit: I am glad that Dr. Gifford was not carried away by his unfortunate experiences to discourage the use of cycloplegics for refractive purposes. There is certainly nothing against and much in favor of the use of a miotic after the use of homatropin and atropin, respectively. The principal point in connection with this question is the problem of the causation of primary glaucoma. While its symptoms and pathology are well understood, its causation is still problematical. The most probable cause of primary glaucoma is the one pointed out years ago by Dr. George M. Gould, namely chronic and unrelieved eyestrain. Eyestrain does raise the tension, not much but perceptibly, and relief of eyestrain lowers heightened tension, also not much but perceptibly. The practical point to the refractionist is to differentiate between the heightened tension of glaucoma and the heightened tension of eyestrain. In the first case a cycloplegic is naturally contraindicated while in the second case the relief of eyestrain must be effected at all hazards, which to me as to most of our colleagues is impossible without the use of a cycloplegic. That this question is not at all problematical was brought home to me a few years ago by a patient, 30 years of age, who came to my office bearing a bottle of drops labeled "physostygmin" and the diagnosis of glaucoma had been made by his oculist. His pupils were narrowed down to pinpoints. The tension was about +1 in both eyes. He had constant eyeache and headache and was unable to use his eyes for near-work longer than for one or two minutes. The fundus, as much of it as was visible through the narrow pupils, was normal. Vision was 20/30 plus o. u. My attempt to refract him without a cycloplegic proved unsuccessful, due to his accommodative spasm. With the permission of the patient I instilled a 2 per cent. homatropin solution every ten minutes for one hour and a half, but even then the refraction was not a success. As the homatropin did not increase the pain or tension I ordered atropin for a day and a half. The atropin instillations relieved the patient of all symptoms of strain or pain. After a careful refraction the patient recovered entirely; the tension became normal and today he is studying medicine. In twenty years I never saw a case of glaucoma produced by a cycloplegic, but I do realize that I run the risk of provoking an outbreak of glaucoma in an eye predisposed to it, but there is the still greater danger of contributing to the causation of glaucoma by not using a cycloplegic for refractive purposes when a cycloplegic is indicated. We must adopt the routine use of a miotic after the use of a cycloplegic.

Dr. John Green, Jr., St. Louis: It seems to me probable that Dr. Gifford's first patient had an established juvenile glaucoma before the instillation of homatropin. This case was reported in 1900 before the days of accurate instrumental tonometry. In eyes, the tension of which is only slightly above the physiologic limit, finger palpation often fails to reveal the glaucomatous state. The fact that the eyes of this patient ever afterward showed a tendency to glaucoma is additional proof of the presence of the disease prior to the instillation of the drug. A chronic glaucoma was converted into an acute glaucoma. A young woman, 26 years of age, consulted me with symptoms of asthenopia—frontal headache, blurred vision in reading, etc. She had a manifest hyperopia of 2 D., with which V. equalled 5/6, either eye. Before using homatropin I examined the eye grounds, and to my amazement found typical glaucomatous cups. Her fields were much contracted. Oft repeated palpation during the three weeks the patient was under observation did not convince me that the tension lay in the glaucomatous zone. (This case also occurred before the days of the tonometer.) Is there anything in the action of homatropin that distinguishes it from other cycloplegic drugs? Dr. Gifford believes that atropin glaucoma has not been reported "because glaucoma from atropin once having been established as a thing to be looked out for, it has not been thought worth while to report it." Atropin does not induce ciliary hyperemia and dissipates it if present. We are all familiar with the congestion of the conjunctiva and ciliary region which follows repeated instillations of homatropin for cycloplegic purposes. May not such congestion ensue from a single drop of a strong (4 per cent.) solution? I doubt very much if other men follow Dr. Gifford in the use of a 4 per cent. solution. 2 per cent. and 3 per cent. are the usual solutions used for cycloplegia and one grain to the ounce will suffice for mydriasis. May not the congestion of the ciliary body and root of the iris induced by homatropin be a factor in the induction of acute glaucoma in susceptible eyes?

Dr. Arthur G. Bennett, Buffalo: I have been in the habit of using a 2 per cent. solution of homatropin with 1 per cent. cocain for about twenty-five years, and I have had two cases of acute glaucoma following this instillation. The first case occurred in a young woman, aged 26, who came in to have glasses fitted. I allowed the homatropin to be put in her eye without examining the fundus, so that I cannot say what the condition of the nerve was. She had a most acute attack of glaucoma in one eye, in which she had 6 diopters of myopia. The eye did not respond to the eserin and I was obliged to do an iridectomy. She made a good recovery. Three years ago a woman about 45 years of age came with the same kind of a history, of vision failing for reading, and I used my stock drops. She had an acute attack in both eyes while in the office. I used eserin and gave morphin hypodermically. The pupils did not come down in the office. I kept her there two or three hours. She had nausea, vomiting and a great deal of edema of the conjunctiva, and was very ill. I sent her to the hospital and followed as soon as possible. When I got there the pupils had contracted and she was well, a recovery with 20/20 vision. The very first time I examined that fundus I would defy you to say that it is a glaucomatous nerve. The tension is normal with the tonometer. Since then I have followed out systematically the use of eserin, two grains to the ounce in every patient, and have had no further trouble.

Dr. Hiram Woods, Baltimore: My experience with homatropin glaucoma is limited to one case, but it was quite instructive. In a man 49 years of age homatropin in 1 per cent. solution was used for mydriasis for examination. He developed a typical acute glaucoma in the office. He was blind and I took him home in a carriage and stayed with him all day, using a 2 grains to the ounce eserin solution. He recovered without permanent bad consequences. The point brought up by Dr. Green was illustrated in that man. I did not inquire into his history at first, but after having done the mischief I found that the man had had from time to time halos about an artificial light. If I had been more careful in getting the history I would have been saved trouble and he would not have suffered a dangerous glaucomatous attack. I think it is important when approaching the age of possible glaucoma to know something of the

history or to examine the field before using the mydriatic. Another point is, what are we to do if we do not use homatropin?

DR. ALBERT E. BULSON, JR., Fort Wayne, Ind.: It is quite possible that the use of a cycloplegic in refraction work is responsible for many more cases of glaucoma than is generally conceded. Doubtless every ophthalmologist of considerable experience has had at least one case, or knows of such cases in the practice of others, cases that have not been reported. I have encountered two instances in which glaucomatous symptoms followed the use of the cycloplegic, though in neither instance were there any serious after-effects, as the condition was discovered promptly and active elimination and the use of miotics brought about a subsidence of the symptoms. However, they pointed to the advisability of using a miotic more often following the use of homatropin for refraction work or to facilitate ophthalmoscopic examination. I do not believe that it is so imperative that miotics should be used in children and young adults, but in patients past 30 years of age it would seem to be a precaution to be adopted. There are, however, a certain number of cases in which atropin is indicated, but before using atropin or any other cycloplegic it is well to take into consideration the tonometer findings and the various clinical manifestations that we know have a tendency to produce glaucoma. This will include faulty elimination, high blood pressure, the shallow anterior chamber, etc. The existence of a beginning simple glaucoma should be eliminated. Another point which is worth considering is the susceptibility which some patients have to the use of eserin. I have seen a marked conjunctivitis, and dermatitis of the skin for a considerable area about both eyes, produced by one instillation of eserin. Pilocarpin, while less effective, is therefore preferable, though more than one instillation is usually required. I never have thought it necessary to give the patient a miotic for home use after having used a miotic in the office, but in view of the possible prolonged action of homatropin, the practice would seem to be a wise precaution. In this connection, however, I wish to emphasize the importance of continuing the effect of the cycloplegic for its sedative influence on strained ciliary muscles; but it is my opinion that these cases should be under careful observation during the cycloplegia.

DR. E. E. BLAAUW, Buffalo: The best prevention of homatropin glaucoma is not to use it. You do not need to use it. It is unphysiologic, in my opinion, and absolutely unnecessary.

DR. JOHN E. WEEKS, New York: I have used homatropin for at least twenty-five years and I have had no case of glaucoma in my own practice. I have, however, seen one case in my clinic and one case in consultation. I have seen one case of glaucoma induced by the use of cocain. It is my custom to take the tension of the eyeball with the finger. I do this in all cases before I apply the mydriatic. If the tension is above normal apparently and the pupil is of moderate size, I do not use the mydriatic. But I do not hesitate to use the mydriatic in cases of known glaucoma if the pupil is small and has been made small by a myotic and I wish to get a clear view of the background of the eye. I use cocain if I can procure suitable dilatation, but if I cannot produce suitable dilatation I do not hesitate to use homatropin. It is my practice to use a miotic in every case after a mydriatic has been employed. The miotic I use in older individuals is eserin; in younger persons, pilocarpin. In young persons if the tension of the eyeball after the use of the mydriatic is normal or below the average normal, I sometimes omit the miotic. If the pupil responds to the miotic only slowly I give them a miotic to use at home. I think if we will carefully study the tension and make it the rule to use the miotic subsequently, the danger of exciting a glaucomatous reaction is certainly small. The case that occurred in the clinic was that of a young woman 17 years of age whose family history was poor. Her mother had had glaucoma. Homatropin was employed by my assistants in determining the refraction. An acute glaucoma followed that same afternoon before the patient had left the clinic. She was admitted to the infirmary and miotics employed, but in spite of the use of strong solutions of eserin the pupils did not become small and I was forced to do an iridectomy. Fortunately, the glaucoma was cured. This occurred about ten years ago; I saw the patient last summer, and no return of glaucoma had taken place.

DR. W. H. WILDER, Chicago: I hope this valuable article by Dr. Gifford will not be misconstrued by certain individuals who attempt to examine the refraction of the eye, because of failure to read the context. It has been extremely gratifying to learn that so few of our members report attacks of glaucoma following the use of homatropin. My experience is limited to only one case in a woman about 48 years of age, in whom the instillation of a 2 per cent. solution excited an acute attack that was promptly relieved by eserin. I am inclined to think, however, that in any case of high tension excited by homatropin, some other cause at some other time might easily bring on an attack of glaucoma against which we should be on our guard. It seems to me that because of certain anatomic peculiarities of the eye that we do not yet understand, a comparatively small number of persons under certain exciting conditions will develop glaucoma, while the vast majority, because of the absence of such anatomic peculiarities, will never have an attack no matter how they or their eyes are excited. I wish to emphasize this thought, that in view of the few cases that occur from homatropin as shown by this discussion we should combat the idea that a mydriatic is not necessary for refraction, and so defeat the purposes of certain irresponsible individuals who are endeavoring to practice this part of ophthalmology.

DR. FREDERICK FRISCH, Atlantic City, N. J.: Referring to the alarming symptoms which have been mentioned after the use of eserin solutions, I found that there was more twitching when much had run over, coming in contact with the skin of the lids. Another reason for the twitching is the rather abrupt action of watery solutions on iris and ciliary muscles. Both of these conditions can be eliminated by using the eserin in ointment form. When watery solutions are used, they should contain one-half per cent. of cocain.

DR. JOSEPH W. CHARLES, St. Louis: Twenty-five years ago I was taught that in cases of glaucoma which could not be operated on for one reason or another, pilocarpin was the mydriatic of choice to be used at home; that there was a definite danger of iritis in certain cases in which eserin was used indiscriminately by the patient.

DR. HAROLD GIFFORD, Omaha: If you use enough eserin you can get adhesions between the iris and the lens; but in the way I have used it it is not necessary, as a rule, to use more than three or four drops, and in almost every case the effect of the homatropin is entirely gone by that night. I generally use three or four drops the first day and have no need of using it afterward, and I have seen no danger from iritis after its use. It seems to me that there are two or three points that ought to be kept in mind as the result of this discussion. First, the importance of being as careful as possible not to use homatropin in a case which is predisposed to glaucoma; but that does not insure you. There is no warrant for allowing patients to go away from the office without eserin after using homatropin. In the cases cited by Dr. Bennett and in mine, in which after they had glaucoma the eyes have been perfectly normal, with no sign of glaucoma by any test one could make, how are you going to find these signs before using homatropin? In other words, the test either by the finger or by the tonometer is not a sufficient safeguard against the possibility of homatropin glaucoma. Second, what shall we do in the way of prophylactic measures before using homatropin? Shall we use the tonometer in every case? I know well there is no use suggesting that. It might receive the official approval of this society, but nobody would do it in all cases, unless just beginning their work. But it certainly is wise if you are going to use homatropin in a patient over 40 to examine the fundus first. Test the case first carefully with the finger, and if there is the slightest question in the history or any other part of the case to suggest danger, use the tonometer.

But even if you do that you are not sure you may not have homatropin glaucoma as the result of its use. Another point that has been brought out is the desirability of using as weak a solution of homatropin as is consistent with the effect to be obtained. I have used a 4 per cent. solution. I did it on the recommendation of the first man who began to use it, and stuck to it. I am going to use a weaker solution. If a 2 per cent. solution will do the work, then we ought to use it. I notice some men use 1 per cent. I am going to try it. The weaker solution is certainly desirable. As to the strength of the eserin to be used afterward, Dr. May has used 0.5 per cent. He has used two drops only and has never seen any trouble. There are thousands who have never used anything and have never seen any trouble; but if two drops of a 0.5 per cent. solution of eserin in the office will do the same thing that a one grain to the ounce solution will do used throughout the next day, let us use it. But I do not believe it gives the same assurance of immunity that the same or a weaker solution would give if the patient took it home to use in case the effect did not pass away; especially patients going out of the city. We must help them out of this danger.

ANGINA EPIGLOTTIDEA ANTERIOR

REPORT OF A CASE CAUSED BY THE BACILLUS INFLUENZAE

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In spite of the conflicting evidence on the question of whether angina epiglottidea anterior is a separate pathologic process, or only a part of a general involvement of the adjacent structures, it is an undeniable fact that a curious inflammation of the epiglottis in which there is remarkably little involvement of the rest of the throat does occur. Clement F. Theisen,[1] in 1900, reported three cases of this disease and was quite positive then that angina epiglottidea anterior, or as he styled it "acute infectious epiglottitis," occurs as a primary affection of the epiglottis. However, this view is disputed by Semon,[2] Kyle,[3] and others. In 1914, Theisen[4] reported another case of this disease and made the statement that added experience with this condition has led him to believe Semon's views, "that the various forms of acute septic inflammation of the throat and neck, hitherto considered as so many essentially different diseases, are in reality pathologically identical, that they merely represent degrees varying in virulence of one and the same process," still hold good and angina epiglottidea anterior should not be classified as a separate process.

During the past fifteen years very little has been written on this disease, so the following case, while strikingly like some of the cases reported several decades ago, may add something to the bacteriology of this condition.

CASE REPORT

Jan. 16, 1916, G. G., a physician, aged 36, developed the sensation of a foreign body in his throat. He had had no previous illness for several years. The following day he consulted me. Examination of the pharynx revealed a slight redness of the mucous membrane. The tonsils were slightly congested but not enlarged. No treatment was administered. By night, however, deglutition became quite difficult and the temperature was 103 F. The patient slept little that night on account of pain in the throat.

The next day, January 18, the symptoms gradually became worse until by night the pain was constant and almost unbearable. Deglutition was now extremely difficult and the temperature was still 103. Breathing was a little difficult while the patient was lying down.

January 19, I made a second examination. The pharynx and faucial tonsils appeared the same as at my first examination. Speech was muffled and there was a nasal twang. A laryngeal examination revealed the source of the trouble. A marked edema of the anterior surface of the epiglottis was present. The epiglottis measured about 1.5 cm. in the anteroposterior diameter, was dark red, and was boggy to the touch. On the anterior surface were two ulcers, measuring about 3 mm. in diameter, round, sharply demarcated, with a grayish exudate covering the base of each ulcer. While a complete view of the larynx could not be obtained, it appeared normal. The lingual tonsils were congested, but not enlarged.

Scarification of the epiglottis was considered as soon as the diagnosis was established, but, as the symptoms seemed to be abating, this was not done. Twice daily the ulcers were cleansed with hydrogen peroxid, and a 1 per cent. ichthyol solution was applied. The ulceration and edema of the epiglottis gradually subsided until by the twelfth day after the onset of the disease the epiglottis was practically normal.

COMMENT

Little is known of the bacteriology of angina epiglottidea anterior. Theisen realized this and attempted to identify the causative organism. He made cultures from the epiglottis in two of his cases, isolating the pneumococcus and streptococcus in one and the pneumococcus and staphylococcus in the other. On the fourth day of the disease in my case, I made cultures and smears from the ulcers. Dr. G. M. Graham, bacteriologist for the Texas State Board of Health, reported that these showed large numbers of influenza bacilli associated with a few pneumococci and staphylococci. The latter were in such small numbers that it is probable they represent the contamination which would almost necessarily result in making a culture or smear from this region. Cultures and smears were again made three days later, when the ulcers showed well marked evidence of repair. The *Bacillus influenzae* had now almost disappeared from the ulcers, leaving the pneumococcus and staphylococcus the predominating organisms.

It appears that the ulceration and edema of the anterior surface of the epiglottis was caused by the *Bacillus influenzae*. While this organism is found in the normal throat, its occurrence in large numbers in almost pure culture on an ulcer would seem to give it a pathologic rôle. It is significant, too, that this infection occurred during the presence of a rather severe epidemic of grip in the patient's community.

In the case outlined above, with the ulceration and edema and all evidence of active inflammation confined to the epiglottis, the process appeared to be primarily in the epiglottis; but my limited experience with this condition prevents me from forming any definite opinion on this point. However, that the *Bacillus influenzae* may, under certain conditions, have a selective activity for the epiglottis, and that this may be of more frequent occurrence than is generally supposed, is a possibility.

1. Theisen, Clement F.: Albany Med. Ann., 1900, xxi, 396.
2. Semon, Sir F.: Tr. Roy. Med. and Chir. Soc., London, lxxxviii, 189.
3. Kyle, D. Braden: A Text-Book of Diseases of the Nose and Throat, 1914, p. 652.
4. Theisen, Clement F.: Tr. Am. Laryngol. Assn., 1914, p. 243.

The Care of the Child.—The duty of bringing up children belongs to the mothers, and whatever we do we must not be too ready to relieve them of their responsibility; we can, however, do much to see that the rights of children are not ignored and that the mothers have the opportunity given them of learning how best to rear their children.—H. T. Ashby, Infant Mortality.

New Instruments and Suggestions

A MOSQUITO COLLECTING DEVICE

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Assistant Epidemiologist, United States Public Health Service

Health officials, entomologists and others who may have occasion to collect mosquitoes in numbers for identification, dissection or experimental purposes will find this apparatus to have decided advantages over the means generally employed. The apparatus is the application of the principles of the fly trap to the capturing of mosquitoes.

The advantages of this means of collecting over the older methods of using test tubes, chloroform and cyanid killing tubes are: (1) rapidity in capturing; (2) absence of injury and rubbing of the specimens by having to close tube; (3) avoidance of wetting specimens with excess chloroform; (4) prevention of escape of insects when an attempt is made to catch more than one live mosquito in a tube (when live specimens are desired); (5) ability to capture mosquitoes on walls, ceilings and other places inaccessible when both hands are necessary to close the collecting tube; (6) relief from necessity for transferring single specimens from collecting tube into containers, thereby saving time; (7) elimination of necessity for carrying a large number of collecting tubes when the collection of a great number of live specimens is desired; (8) avoidance of loss of time awaiting death of mosquitoes by weakening of killing agent.

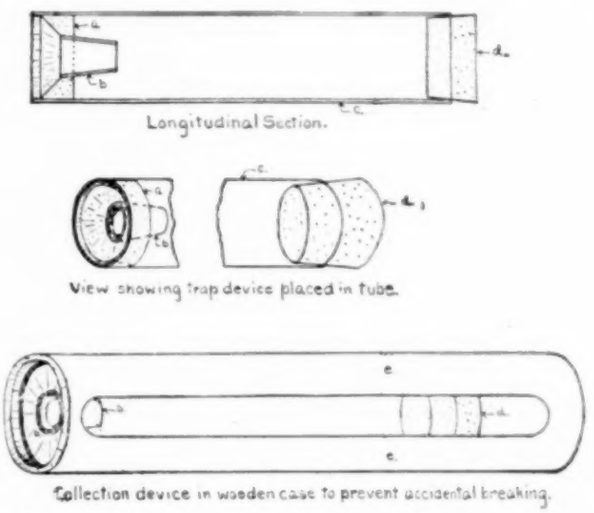
A collecting tube of any size may be used, but the one preferred and recommended is a glass (or celluloid) tube about 1 inch in diameter and 5 inches long, open at both ends, one end of which, when in use, is closed with a cork or other stopper, the other end with the specially designed or devised trap arrangement shown in the accompanying illustration. The trap end may be described thus:

A cork stopper to fit the tube, three-eighths inch thick, having a central opening half inch in diameter, large enough to accommodate the "trap" tube. The upper surface of this cork is beveled from the outer edge to the inner opening, giving it a funnel shape.

A small glass tube about three-fourths inch long, having a truncated cone shape to fit tightly in the opening of the funneled cork, the outer end half an inch in diameter and tapering for its length, with an inner opening three-eighths inch in diameter.

The small conical trap tube may be made from half inch glass tubing, or the end of an ordinary plain glass centrifuge tube, cut to measure, may be used. A cone of glass or celluloid has the advantage that the entrance of mosquitoes may be observed. The cork with the trap tube is placed in the end of the collecting tube so that the thin edge of the cork is about one-eighth inch clear of the rim of the collecting tube.

Instead of glass tubes, celluloid, such as used for windows in automobile tops, may be made into the size tubes desired and fastened by small brads or paper fasteners. Additional strength is afforded by several turns of adhesive plaster around each end. Advantages of celluloid over glass are its being nonbreakable, it is lighter and for field workers any amount may be carried in sheets and tubes made as required.


Longitudinal Section.
View showing trap device placed in tube.
Collection device in wooden case to prevent accidental breaking.

Device for collecting mosquitoes: *a*, funnel-shaped cork stopper three-eighths inch thick having central opening half an inch in diameter; *b*, small glass tube of truncated cone shape three-fourths inch long; diameter of large opening, half an inch; of small opening, three-eighths inch; *c*, glass tube 5 inches long, 1 inch diameter, open at both ends; *d*, cork stopper for untrapped end; *e*, wooden cylinder to prevent accidental breaking of tube.

In making a catch, the trap end of the tube is placed over the resting mosquito. The insect finds that it is surrounded, and in attempting to escape selects the only way out toward the light, through the glass cone into the large collecting tube.

In experiments to determine the rapidity of capturing and the efficiency of the trap in retaining the mosquitoes, it was observed that the insects passed almost immediately through the trap end of the tube, so that the operation could be repeated as rapidly as the tube could be placed over the insects. The average time for each catch from the time of placing the tube over the mosquito was three seconds. These catches were made in New Orleans in the month of February. Probably in hot weather and with greater activity of the insects, catches would be even more rapid.

The results of tests showed that the size of the lumen of the small truncated cone (the trap) had to do more with the rapidity of capture than the escape of the insects from the tube. Five tubes having different sized cones were used, the external opening ranging from five-sixteenths inch to half an inch and the internal or smaller opening from three-sixteenths to three-eighths inch. Of eighty specimens of *Anopheles crucians* caught and retained in the five collecting tubes and placed under lantern globes closed with mosquito netting, only one escaped in twenty-four hours. This occurred from the tube with the largest openings (three-eighths by one-half inch).

For collecting mosquitoes to be used experimentally in the laboratory, the number of specimens to be caught in the tube of the capacity given above probably should not exceed more than ten, as injury to each other may occur. However, if they are being caught rapidly and transferred to large cages or other containers, greater numbers of them may be caught in each tube.

The same principle may be applied to the large cyanid collecting tubes (2¼ by 6 inches), the only difference being the larger sized cork required for the trap apparatus. The capture is somewhat slower, as the insect has a greater degree of freedom in the larger funneled cork. The mosquitoes will not escape, however.

The small collecting tube described may be carried in the pocket, as mosquitoes were found not to escape even if the tube was darkened. Caution should be used in keeping mosquitoes in tubes without moisture for more than an hour or so. The necessary moisture can be supplied by placing a plug of moistened cotton in the trap.

Killing by the use of chloroform or other agent may be accomplished with this tube as with the apparatus generally used for such process.

The device described is easily made by any one, or could be put on the market by manufacturers of entomologic apparatus at a small cost.

U. S. Marine Hospital.

Protein in Diet.—The quantity of protein desirable in the dietary had best be given consideration after discussion of the dietary habits of mankind. It is sufficient for the present to realize that protein is necessary to maintain tissue in repair, to promote growth and that when taken above the requirements for these purposes it stimulates the organism to a higher level of heat production.—Lusk, The Fundamental Basis of Nutrition.

Therapeutics

ACUTE ANTERIOR POLIOMYELITIS (INFANTILE PARALYSIS)

This article is reprinted at this time—with corrections and additions—because of the extensive outbreak of infantile paralysis in New York. The article appears in "The Prevention and Treatment of Infections," published by the American Medical Association, in 1915.

Acute anterior poliomyelitis is an inflammation of the anterior gray matter of the spinal cord, that portion supplied by the central arteries, the branches of the anterior median artery of the anterior longitudinal fissure. However, it may also effect both the white and gray matter of the brain, the intervertebral ganglia and the abdominal ganglia. Flexner believes that the route of infection is practically always by the nasal mucous membrane to the lymphatic channels of the olfactory lobes, the spinal fluid and then to the nerve tissues.

It was not definitely shown, until 1909, that this disease belonged to the infections and was contagious, although it had been long suspected. More or less isolated instances and some slight group attacks had occurred in America for many years, but we have had epidemics only since 1907, caused probably by importations of the germ from Europe, where it has been long endemic. In 1909, Landsteiner and Popper reported that they had caused infantile paralysis in monkeys by inoculating them with a spinal cord emulsion obtained from a child who died from this disease. Noguchi and Flexner later reported that they had been able to cultivate a causative organism of this disease. Recently, Flexner and his co-workers[1] have shown that the contagium is contained in the secretions of the nose, and that undoubtedly there are carriers of this disease. It seems to be demonstrated that the infection or poison reaches the nervous system through the lymph, but probably reaches its point of activity, namely, the spinal cord, by means of the cerebrospinal fluid. In previous experiments Flexner and Amoss[2] have shown that in all probability infection does not reach the individual from the bites of insects, as they were unable to infect monkeys by directly introducing the virus into the blood. This does not preclude the possibility of domestic animals like cats and dogs carrying the contagium and causing infection by way of the nostrils and lymph channels. It has not been shown that flies transmit the contagium, nor that the association with stables has increased the liability of infection, as has been suggested. It does not seem frequent that more than one person in the same household is affected, although such cases occur. However, in epidemics the majority of patients are likely to come from the same general region.

Fraser[3] of New York reports his observations on ninety cases of epidemic poliomyelitis. He found that the age varied from 9 months to 14 years. The majority of cases, especially when it is sporadic, has always occurred in young children under 5 years of age. The death rate is generally low, varying from 4 to 16 per cent., but the paralyses resulting are constant and frequent.

Flexner and Lewis' splendid work on this subject is reported in various numbers of The Journal.[4] They state that the infecting agent in this disease belongs to the class of minute filterable viruses which cannot be demonstrated with certainty by means of the microscope. They also showed that spinal fluid withdrawn on the third day of the infection, before the appearance of paralysis, contains the virus which will cause infections of monkeys. Flexner, Noguchi and Amoss[5] have recently again shown that the minute micro-organism isolated from poliomyelitic tissue is probably an etiologic factor, if not the cause, of epidemic poliomyelitis. Flexner and Lewis[6] also showed that the disease can be transmitted from monkey to monkey. They further showed that the germ or virus resists freezing, and therefore the disease is not stopped by cold weather. They also believe that one attack confers immunity.

Lucas[7] found that monkeys after inoculation showed a lymphocytosis during the acute stages, but a marked and constant leukopenia. The blood at this time also showed an eosinophilia. This disturbance in the white blood count disappeared when the acute stage was over.

PREVENTION

It is quite probable that the so-called "distemper" which at times attacks dogs and may attack horses, is really caused by this same infection. Hence, a dog affected with distemper should be isolated, and no child should be allowed to associate with it. While it has not been shown that flies will carry this disease, in all probability they may transmit the infection by their feet. Consequently, flies should be excluded by proper screens, if possible, from any animal that suffers from distemper, and certainly should be prevented from reaching an individual sick with poliomyelitis.

As early as Feb. 12, 1910, Flexner and Lewis[8] showed that this disease was contagious by means of the secretions of the mucous membrane of the nose especially, and also of the throat, and therefore that every patient should be isolated, and that the disease should be made reportable to the boards of health.

The nurse and the family should understand that the same care must be exercised in destroying the contagium and preventing the contamination of articles and substances by the secretions of the nose and throat of a poliomyelitis patient as is so well understood must be taken in diphtheria.

As soon as a case is reported to the board of health, the school board should be informed (as such cases are frequently in children too young to go to school) that they may send home from school the other chil-

1. Flexner, Simon, and Amoss, Harold L.: Localization of the Virus and Pathogenesis of Epidemic Poliomyelitis, Jour. Exper. Med., Sept. 1, 1914, p. 249; abstr., The Journal A. M. A., Sept. 26, 1914, p. 1136.
2. Flexner, S., and Amoss, H. L.: Penetration of Virus of Poliomyelitis from Blood into Cerebrospinal Fluid, Jour. Exper. Med., April, 1914, p. 411; abstr., The Journal A. M. A., April 25, 1914, p. 1360.
3. Fraser: Am. Jour. Med. Sc., July, 1914, p. 1.
4. Flexner, Simon, and Lewis, Paul A.: The Transmission of Acute Poliomyelitis to Monkeys, The Journal A. M. A., Nov. 13, 1909, p. 1639; The Nature of the Virus of Epidemic Poliomyelitis, ibid., Dec. 18, 1909, p. 2095; Experimental Epidemic Poliomyelitis in Monkeys, ibid., April 2, 1910, p. 1140; Experimental Poliomyelitis in Monkeys, ibid., May 28, 1910, p. 1780.
5. Flexner, Simon; Noguchi, Hideyo, and Amoss, Harold L.: Concerning Survival and Virulence of the Microorganism Cultivated from Poliomyelitis Tissues, Jour. Exper. Med., January, 1915, p. 91.
6. Flexner, Simon, and Lewis, Paul A.: Epidemic Poliomyelitis in Monkeys, The Activity of the Virus, The Journal A. M. A., Jan. 1, 1910, p. 45.
7. Lucas: Tr. Mass. Med. Soc., June, 1910; the subject is also discussed by Gay, Frederick P., and Lucas, William P.: Anterior Poliomyelitis. Methods of Diagnosis from Spinal Fluid and Blood from Monkeys and in Human Beings, Arch. Int. Med., September, 1910, p. 330.
8. Flexner, Simon, and Lewis, Paul A.: Epidemic Poliomyelitis in Monkeys. A Mode of Spontaneous Infection, The Journal A. M. A., Feb. 12, 1910, p. 535.

dren of the family, and if there is an epidemic, perhaps the other children of that tenement. The incubation period is said to vary, and may be as long as ten days, but to be safe from causing infection in others, such children should remain out of school for two weeks.

EARLY SYMPTOMS

During an epidemic symptoms of acute infection with fever, excessive irritability and hyperesthesia should be suspected of infection with this disease.

Although a patient who is old enough may complain of headache and pains, especially in the epidemic form of the disease, still, in this as well as in the sporadic form, the onset may be so rapid that a child well the night before may be found with high fever and even with paralysis in the morning. Pain is referred generally to the muscles of the back and legs, and later to the muscles of the arms. The temperature in serious cases may be high, but the ordinary range of rectal temperature was found by Fraser to be from 101 to 103. The pulse-rate is high, and is generally over 120. While pain may keep the little patient awake, and there may be a great amount of irritability and restlessness, drowsiness and heaviness was noted by Fraser in half of his cases, although there were often twitchings and jerkings during sleep. In two-thirds of his cases he found stiffness of the neck and back, which is so characteristic of cerebrospinal meningitis. The greatest tenderness is found generally in the extremities. Although this might last but one or two days, it sometimes persists for three or four weeks. The tendon reflexes are found generally absent.

The spinal fluid is clear, with a moderate increase of cells and of globulin. In the first week, the cells are more increased and the globulin scant or absent. Many of the cells may be polymorphonuclears. In the second and third weeks both the total number of cells and the proportion of polymorphonuclears are decreased and the other types of cells increased. In some cases, however, the fluid may appear normal.

Although, as just stated, paralysis may occur almost coincident with the illness in sporadic cases, in epidemic cases paralysis seems to develop most frequently on the third or fourth day. The acute illness lasts from one week to ten days. A large number of Fraser's cases showed some slight facial paralysis. If the respiratory muscles were affected, the prognosis was dire. There may be paralytic interference with urination, and defecation may be difficult from inability of the abdominal muscles to act.

It should be remembered that many abortive forms of this disease probably occur without any paralysis, and many times without a diagnosis, and such cases may doubtless spread infection. Koplik,[9] in reviewing an epidemic of 1,200 cases, states that many atypical forms occur.

As to the extremities, one or both arms may be paralyzed, or one arm and one leg, or both legs, or there may be crossed arm and leg paralysis. The arm paralysis is not often complete, and the recovery is more rapid. Complete loss of response to faradism means a bad prognosis as to recovery, and atrophy will rapidly occur. If response to faradism is not completely lost, the outlook, with proper care and treatment, is good. The rapidity of recovery from paralysis, and the number that completely recover vary with the different epidemics; but the number that completely recover is lamentably small. More scientific treatment by nerve and orthopedic experts will doubtless make this percentage of complete recoveries much greater.

9. Koplik, H.: An Epidemic of Acute Poliomyelitis, Arch. Pediat., May, 1909, p. 321.

TREATMENT

A. The Acute Stage.—The same care in isolation, and of the secretions of the nose and throat, to prevent possible infection of others or contamination of articles, should be carried out as has been described for the other infectious diseases. Flies and all domestic animals must positively be excluded from the sickroom. As soon as the diagnosis is positive, the disease should be reported to the board of health, whether or not it is a reportable disease in the community.

Flexner[10] has shown that bedbugs may become infected with this disease. Whether or not they can transmit the disease to a human being by their bites has not been shown. Mosquitoes and lice have not yet been shown to be guilty of carrying the infection, but they, as well as bedbugs and fleas, should be eliminated.

As Flexner states that the virus is eliminated by the intestines as well as by the nose and throat, all movements of the bowels during the course of the disease, and perhaps for some little time after the acute stage is over, should be as thoroughly disinfected as they are in typhoid fever. Lucas and Osgood[11] found the virus in the nasal secretions of a human being four months after the acute stage of an attack of poliomyelitis. They also found the virus in the nasopharynx of persons who were in attendance on a patient ill with the disease, and in the nasopharynx of a patient who had had the disease 204 days after the acute infection. Kling,[12] however, thinks that the virus soon loses its virulence, and that quarantine need not be continued for more than two weeks. It cannot yet be decided just how long quarantine should be continued, but two weeks should be the under limit, and better, three weeks. That more of the attendants or associates of a patient sick with poliomyelitis do not contract the disease may be because they are insusceptible, or they may have become immune from some previous abortive attack.

There has not yet been produced an antiserum, although it is most sincerely hoped that Flexner and his co-workers will be able to add such a serum to the list of their splendid achievements. With our better knowledge of the action of hexamethylenamin, we cannot expect germicidal activity in the cerebrospinal fluid, which is alkaline. It has been shown that this drug has no germicidal activities, except in an acid medium, and, therefore, it is of special value only in infections of the pelvis of the kidney, ureters, bladder and urethra, and then only when the urine is acid. Hence, when the disease has started, there is no known medical method of aborting it, although mild infections may abort without paralysis.

The treatment in this stage of the disease is to relieve cerebral and spinal congestion and remove all possible toxins that may be absorbed from the intestinal canal by free but gentle catharsis. Calomel, in

10. Flexner, Simon: The Mode of Infection in Epidemic Poliomyelitis, THE JOURNAL A. M. A., Oct. 12, 1912, p. 1371.
11. Lucas, William P., and Osgood, Robert B.: Transmission Experiments with the Virus of Poliomyelitis, THE JOURNAL A. M. A., May 24, 1913, p. 1611.
12. Kling, Carl: The Etiology of Epidemic Poliomyelitis, Wien. klin. Wchnschr., Jan. 10, 1913, p. 41.

one sufficient dose, associated with cascara, aloin or rhubarb, as deemed advisable, is always a good method of treatment. Castor oil is another, or at times a quickly acting saline cathartic may be advisable. Subsequently the bowels should be moved as frequently as the diet and the condition of the intestines seem to require. A child that is not taking much food for the first two or three days after the first cleaning out of the intestines need not necessarily be bothered with a laxative every day during this first stage of the disease. As soon as paralysis begins, it may be difficult to cause the bowels to move, and a simple glycerin suppository or a small enema may be needed.

The child must not be allowed to forget to urinate, as some loss of normal bladder irritability may allow urine to be retained and distention of the bladder to occur. Therefore, the child should be encouraged to urinate at about four-hour intervals. Of course, if the urine cannot be passed, it must be drawn.

Generally the fever is not high. If it is high, two or three small doses of acetanilid may be administered; or sponging the body with warm water is advisable. General cold sponging or general cold applications are inadvisable, as tending to cause increased congestion of the central nervous system. The value of an ice cap as a reducer of temperature is doubtful, and it is likely to cause the child to become more restless. The value of a spinal ice bag is also doubtful, as many times these cold applications cause an increase of pain.

Pain must be stopped in a child as well as in an adult; this fact is often forgotten. The physician allows a child to suffer because he dislikes to give strong narcotics, when an adult would demand something to stop his pain. If there is high fever and a few doses of acetanilid have been given, this may prevent some of the pain, but pain is most safely combated by small doses of morphin, codein, or opium in some form. Perhaps there is no better method of giving this narcotic drug to a child than by means of the deodorized tincture of opium. The dose may be, even to a young child, one drop every hour for five hours until the child is sleeping or is quiet. If the child is very young, of course the dose should be less, and for a child 10 years of age the dose should be larger. If the brain is so affected that the child is stupid, pain is not much felt, and narcotics will not be needed. Unless the child is excessively nervous, restless, sleepless, and twitching and jerking about the bed, such cerebrospinal depressants as chloral and bromid are not indicated, as one can but feel they might tend to increase the muscle debility and paralysis that must follow the acute stage of the disease. It seems safer and more rational to give for this condition opium or one of its alkaloids in a dose sufficient to cause quiet and rest.

In this disease, as in all forms of meningitis, the bedroom should be quiet and removed as far as possible from all noise and disturbance. The child should not be unnecessarily spoken to, and there should be frequent darkening of the room in order that the patient may get all the rest possible.

During the active stage food should not be pushed. Part of the diet should be milk, and the rest of it should be cereal gruels. The diet should not be wholly milk, for in this as in all acute diseases the possibility of acidemic conditions occurring should not be forgotten, and starches should always be given in the form most acceptable to the patient. The first day or two the child will be thirsty, and should be allowed all the water it desires. As soon as the fever diminishes or ceases, nutrition should be pushed, and the child should be encouraged to eat so that the general strength may be recovered as rapidly as possible. If at this time the tongue is coated, the digestion poor and the appetite insufficient, it may be because gastric acidity is insufficient, and a few drops (not more than five) of dilute hydrochloric acid, in water, after meals, may aid in overcoming these conditions.

B. Local Treatment.—Fixation of the painful extremities and of the back, in the most restful position, with the aid of cushions and pillows, is important during the acute stage. As there is no special inflammation in any joint or muscle, cold or ice to a painful region is not indicated. Dry warmth may cause a lessening of the pain and is often of value. If the limbs affected become cold from disturbed circulation, they should be surrounded with cotton or covered with flannel. Restriction by bandages is inadvisable.

The pathologic lesions of the disease may be studied in an article by Flexner, Clark and Amoss.[13] Several years ago Lovett and Lucas[14] studied 635 cases of infantile paralysis, and came to the conclusion that paralysis of one leg was nearly four times more frequent than paralysis of both legs, and paralysis of an arm and leg of one side was more common than was a crossed paralysis. The internal muscles of an extremity were more frequently affected than the external, and the anterior than the posterior. The most common muscle to be affected in the leg they found to be the quadriceps; the next in frequency was the tibialis anticus and anterior muscles of the lower leg. If the hamstring muscles were affected it was more often the internal than the external, and the sartorius muscle they found frequently not to be affected even when the quadriceps was. They found the internal rotators of the thigh more frequently affected than the external rotators, and the adductors more frequently than the abductors. The short toe flexors they found the least likely to be affected. In the upper extremity, the arm is more frequently affected than the forearm, and the deltoid the muscle most affected, although the biceps, triceps and scapular muscles may also be affected.

During the first stages of the paralysis great care must be taken in watching the position of the limbs, especially the legs, to prevent contractions caused by the pulling of the unaffected muscles. Massage is soon valuable, but must be very gentle. Proper massage will not only increase the nutrition of the affected muscles, but cause relaxation of spasm of the unaffected muscles. It may be necessary to devise some apparatus to keep the leg or foot from becoming deformed. For this purpose various splints, or wooden or wire troughs properly padded with cotton may be used. Gibney and Wallace[15] urge that the legs should be kept straight or in slight flexion at the knees and in line with the body, while the feet should be kept at right angles with the legs.

The value of having the child, as early as possible, make slight voluntary efforts with the paralyzed muscles is excessively important. All neurologists and orthopedists now believe that one voluntary contrac-

13. Flexner, S.; Clark, P. F., and Amoss, L.: Epidemiology of Poliomyelitis, Jour. Exper. Med., Feb. 1, 1914.

14. Lovett, Robert W., and Lucas, W. P.: Infantile Paralysis. A Study of 635 Cases with Especial Reference to Treatment, The Journal A. M. A., Nov. 14, 1908, p. 1677.

15. Gibney, V. P., and Wallace, Charlton: The Recent Epidemic of Poliomyelitis, The Journal A. M. A., Dec. 21, 1907, p. 2082.

tion of a muscle is of very much greater value than many passive activities of a muscle or contractions caused by electricity or other irritant.

Some writers believe that counterirritants applied to the spine, such as cautery treatments, are of value in hastening the stage of resolution of this disease. While they may be of value, consideration must always be given to the disturbance that it will cause the child who has suffered enough pain, and who already has difficulty in finding comfortable positions in bed.

C. Paralysis.—When the circulation is poor in an extremity, the local application of heat in any form, and perhaps by baking, is of value. As soon as it is believed that all active inflammation in the spinal cord has ceased, electricity should be begun, and Jones[16] believes that electricity should not be used until from three to eight weeks from the beginning of the infection. Galvanism should then be used on the nerve trunks, gently and not too strong, while the muscles are caused to contract by faradism as long as they react to that current. If they do not react to the faradic current, the galvanic current should be used to cause contraction by making and breaking. The rapidity of the making and breaking galvanic current should not be too great, nor should any kind of muscle stimulation be continued too long at any one sitting; in fact, at first only a few contractions should be caused.

Voluntary training directed by a skilled orthopedist, and the application of any splints or apparatus that may be necessary to prevent deformities and atrophies should soon be inaugurated, as Taylor[17] and many others believe that massage and electricity are very ineffective in causing recovery of muscles paralyzed by poliomyelitis. All physicians and surgeons urge that the greatest improvement is caused by plenty of rest in bed, graded exercise, warm baths, good food and fresh air. In other words, the better the nutrition the greater the improvement in the paralyzed muscles. Muscles may even recover after a year or more of paralysis when treated by a skilled orthopedist. It should be emphasized that rough, harsh massage and misdirected use of electricity may do serious harm to the paralyzed and contracted muscles. In a word, the general practitioner should as quickly seek the aid of the orthopedist in treating the paralysis of this disease as he would seek a skilled aurist in an internal or middle-ear inflammation.

Surgical repair of deformities that cannot be corrected by apparatus or muscle training has now reached a stage never equaled before, and tendon transplantation and other orthopedic operative measures cannot too soon be considered when improvement ceases to occur in a limb affected with paralysis from poliomyelitis.

Lovett[18] reported an investigation of 293 cases which occurred in the Vermont epidemic during the fall of 1914. In that epidemic the muscles of the limbs nearest the trunk were more frequently affected than the distal ones—the left arm muscles more frequently than the right. The muscles in the right and left leg were equally affected. From his investigation Lovett believes that much smaller degrees of overuse may be more deleterious than is generally supposed. In the early stage of returning power exceptional care should be taken in the use of muscles in walking and in the use of heavy and prolonged massage. The proportion of total to partial paralysis is greatest in muscles which have the greatest weight to oppose in standing and walking positions and least in those which have the least weight. Meara[19] summarized therapy for the prevention of paralysis as follows:

"The essence of the therapy is rest of function of the affected parts and hence, the inflamed cord centers supplying those parts. Rest means not only a comfortable bed, careful nursing, devices to find comfortable positions for the painful members, but also freedom from excitement, entertainment and visitors and, particularly, avoidance of pernicious measures of mechanico- or electro-therapeutics, often insisted on by the parents in an eagerness to see something done for the condition."

16. Jones, R.: Infantile Paralysis (Acute Anterior Poliomyelitis). Its Early Treatment and Surgical Means for Alleviation of Deformities, Brit. Med. Jour., May 30, 1914; abstr., THE JOURNAL A. M. A., July 4, 1914, p. 63.

17. Taylor, H. L.: The Management of Poliomyelitis and Its Sequelae, Med. Rec., New York, Oct. 15, 1910; abstr., THE JOURNAL A. M. A., Oct. 29, 1910, p. 1590.

18. Lovett, R. W.: The Treatment of Infantile Paralysis, THE JOURNAL A. M. A., June 26, 1915, p. 2118.

19. Meara, F. S.: The Treatment of Acute Infectious Diseases, 1916, p. 364.

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SATURDAY, JULY 8, 1916

THE SIGNIFICANCE OF NITRATES IN HUMAN URINE

Combined nitrogen, it has been well said, is the common capital of the living kingdom. In an environment like that of the earth's surface, with an atmosphere of which free nitrogen constitutes four fifths of the gases, the element can nevertheless be taken up by most plants in the form only of ammonia, nitrites or nitrates. To animals even these compounds have appeared to be useless; and the only source of nitrogen to this class of living organisms, which includes man, has seemed to be the protein which has been built up by the agency of the plant cells. It has not been easy to dispose of the possibility that gaseous or elementary nitrogen may play a part in the processes of animal metabolism. The careful experiments of Oppenheimer[1] and Krogh[2] have at length demonstrated conclusively, however, that no nitrogen is eliminated in the free state from the body and that the earlier claims of positive findings were based on experimental errors.

The question of the metabolic significance of nitrites and nitrates has not been so readily settled. Not only has the possibility of the assimilation of nitrogen in the form of ammonium salts provoked discussion,[3] but also the availability of nitrates for constructive purposes in mammalian metabolism has been seriously suggested. The increasing recognition of fundamental biologic similarities in the chemical processes of plants and animals has contributed to the promotion of such a hypothesis; for it often seems as if the real difference between these two groups of living forms were a quantitative rather than a qualitative one. Why, then, should animal forms not be able to utilize nitrates in some degree? Not to venture a final word, the consensus of opinion indicates that although nitrates may influence the progress of nitrogenous metabolism, they do not enter into constructive processes. Ingested nitrates can be recovered quantitatively in the excreta.[4]

Although nitrates cannot enter into the constructive processes of the higher animals, it by no means follows that they never represent the end-products of nitrogenous metabolism in these species. Human urine, as well as that of animals, has long been known to contain nitrates under ordinary conditions of living. Calculated as the potassium salt, the quantity is represented by amounts varying from 100 to even 400 mg. per liter (quart). The wide distribution of nitrates in food materials, especially in fresh vegetables,[5] has quite naturally led to the supposition that the urinary nitrates have their sole origin in the food consumed. Obviously the solution of this problem became a matter of exact determinations of the nitrate "balance" of the organism. An elaborate research[6] in the Department of Animal Husbandry at the University of Illinois in Urbana has indicated, in most cases beyond reasonable doubt, that the animal body may excrete in the urine more nitrate than is ingested in the food. The marked differences between the determined nitrate intake and nitrate excretion cannot be accounted for by differences in the accuracy of the analytic methods as applied to foods and to urine.

It is conceivable that nitric and nitrous acids in the air may gain access to the blood by way of the lungs and thus ultimately reach the urine. This explanation of the source of the excess of nitrate appearing in the urine over the nitrate ingested with the food is excluded, however, by a consideration of the maximum quantity of nitrate which could be formed in this way, even if the lungs were readily permeable to the nitric fumes. From Mabery's[7] figures obtained by analyses of samples of air taken at Cleveland, it may be shown that the total quantity of nitric acid which would be introduced into the lungs per day, on the assumption that the the tidal air is 500 c.c. and the respiration rate 20 per minute, would average about 5 mg., the maximum being 15.3 mg. The quantity of nitrous acid inhaled is entirely negligible.

The alternative explanation is that the body tissues are able to produce nitrates from unoxidized nitrogenous radicals. The Illinois investigators remark that the problem is of peculiar theoretical interest, since the production of an oxidized nitrogenous product by animal tissues would be unique. The ordinary end-products of nitrogenous metabolism — urea, uric acid, creatinin, ammonium salts, etc. — are of quite different type. Nevertheless Mitchell, Shonle and Grindley believe that the production of nitrates by animal tissues is a fact and is unique in being the only well established instance of the oxidation of nitrogen, aside

1. Oppenheimer, C.: Ueber die Anteilnahme des elementaren Stickstoffes am Stoffwechsel der Tiere, Biochem. Ztschr., 1906, i, 177; Ueber die Frage der Anteilnahme elementaren Stickstoffs am Stoffwechsel der Tiere, ibid., 1907, iv, 328.
2. Krogh, A.: Sitzungsb. d. Wien. Akad., 1906, cxv, (3).
3. Underhill, F. P., and Goldschmidt, S.: Studies on the Metabolism of Ammonium Salts, III, The Utilization of Ammonium Salts with a Non-Nitrogenous Diet, Jour. Biol. Chem., 1913, xv, 341.
4. Abderhalden, E.: Lehrbuch der physiologische Chemie, 1915, ii, 1216.
5. Richardson, W. D.: Jour. Am. Chem. Soc., 1907, xxix, 1757.
6. Mitchell, H. H.; Shonle, H. A., and Grindley, H. S.: The Origin of the Nitrates in the Urine, Jour. Biol. Chem., 1916, xxiv, 461.
7. Mabery, C. F.: Jour. Am. Chem. Soc., 1895, xvii, 105.

from the conversion of nitrites to nitrates, which is apparently a reversible reaction. Pending the permanent solution of the fundamental question here involved it would, as they say further, be mere speculation to attempt a theory of the manner in which this oxidation is accomplished, of the intermediate products formed, of the particular organ responsible for it if its production is at all localized, or of the biologic significance of the process.

IS CANCER OF INFECTIOUS NATURE?

Malignant new growths are found in various classes of the animal kingdom and seemingly also in plants. Although cancers were recognized and treated surgically by Galen, the modern conception arose only with the discoveries of Virchow in 1853 and the theory of Cohnheim in 1867. Since that time innumerable workers have approached the problem of cancer from every angle. The clinical symptoms, the gross and microscopic anatomy, the rate and manner of growth, the production of metastases, the chemical changes produced, and their biologic aspects in general have been thoroughly investigated. Little concerning many of these phases remains to be discovered, but of their cause little indeed is known. The theory of Cohnheim remained the most tenable until recent years. At various times, bodies have been found in cancer which were interpreted as protozoa, bacteria or yeasts. The failure to cultivate these bodies, together with the demonstration that they were most likely products of degenerative changes, and other reasons, led to the conclusion that they were not etiologic factors. Recent evidence concerning the infectious origin of cancer has been discussed in these pages.[1] What seems to be important evidence in favor of the parasitic theory is being brought forward by Erwin F. Smith, pathologist of the Laboratory of Plant Pathology, Bureau of Plant Industry, U. S. Department of Agriculture.[2]

For a number of years he has been studying crown gall of plants. Crown gall is a growth occurring in many plants. It is a new growth in which many characteristics typical of cancer in man are found, namely, (1) the vegetative (embryonic) character of the cells; (2) the rapidity of growth; (3) the peripheral extension, lack of capsule and infiltration of surrounding tissue; (4) the tendency to central degenerative changes; (5) the liability to recurrence after removal; (6) the cachexia, and (7) the tendency to develop metastases in which is reproduced the cell complex of the primary tumor. By means of ingenious staining and cultural methods, an organism has been found and isolated in pure culture which fulfils Koch's postulates for a specific organism. This is called *Bacterium tumefaciens*. By means of inoculation, growths resembling the original are produced. Now further experiments appear to show that growths resembling sarcoma, carcinoma and epithelioma, mixed tumor, and embryoma (teratoma) can be produced according to the part of the plant and the age of the plant inoculated. Thus sarcoma is formed when the bacterium is introduced into the connective tissue of young plants or well nourished actively growing parts of older plants. Carcinoma and epithelioma develop when the epithelial tissue is inoculated. Perhaps the most striking result is the development of embryoma. By the inoculation of *Bacterium tumefaciens* into the vicinity of growing buds, growths containing all the primary germ layers are produced. Smith explains this in the following manner: "The bud anlage is torn to fragments by the rapidly growing tumor and these fragments are variously distributed and oriented in the tumor where under the stimulus of the parasite they grow into abortive organs." Teratoma is produced also in the leaves of young tobacco plants where no dormant buds are known to exist. Smith explains this by the assumption that certain widely distributed normally arranged cells or groups of cells, and possibly all cells when very young and plastic, carry the potentiality of the whole organism, which potentiality is not ordinarily developed on account of division of labor, but comes into action when the physiologic control is disturbed or destroyed. Teratoma is produced in tobacco leaves only by inoculating very young leaves. When older leaves are inoculated they either do not respond, or yield only the ordinary crown galls.

Smith's hypothesis of the action of the organism is as follows:[3]

> "The micro-organism, entering the cells as the result of slight wounds, grows rapidly for a short time. Its growth is then inhibited apparently by its own by-products. As the result of this inhibition many of the bacterial rods swell, becoming clumpy and variously branched, giving rise to the so-called Y bodies. There then ensues death for many, and a dormant period for the remainder. The organisms which are killed outright, by the by-products evolved during their previous growth in the cell, are the ones which now stimulate the nucleus to development. This I conceive to take place by endotoxins or other substances. As soon as the nucleus begins to divide, its membrane disappears, and its contents flow into the cell, . . . the benumbed bacteria take on new growth, and pass over into the daughter cells" where the process is repeated.

Inoculation of the organism into brook trout produced small nodular growths at the point of inoculation, but the fish died before it could be determined whether or not the growths were malignant in structure.

To recapitulate: Crown gall, according to Smith a cancer of plants, is due to a bacterial organism (*Bacterium tumefaciens*). Pure cultures of the organism when inoculated into plants produce sarcoma, carcinoma and epithelioma, mixed tumor and embryoma,

1. Infectious (?) Cancers in Animals, editorial, THE JOURNAL A. M. A., March 11, 1916, p. 816.
2. Smith, E. F.: Jour. Cancer Research, 1916, i, 231; Science, 1916, xliii, 871.
3. Smith: Proc. Seventeenth Internat. Cong. Med., Section III.

depending on the part of the plant inoculated and the age of the plant.

These results upset our orthodox views concerning cancers. That sarcomas, carcinomas and embryomas are due to the same organism would seem scarcely possible, yet certainly they are no more dissimilar than a hunterian chancre, a rupioid syphiloderm, a gumma or the degenerative processes of general paresis. Perhaps a Koch or a Schaudinn will appear, and by new and ingenious methods demonstrate the essential unity of cancers in man. The work of Smith would seem to indicate such a possibility. For the present it would seem that the statement made in a previous review of Smith's interesting work on new growths in plants still holds good: [4]

> If it becomes necessary to adopt the view advanced by Smith that the crown gall he has studied with such success is a true cancer, then to him will belong the credit of having discovered first the precise cause of a cancerous growth. On account of the absence of complete analogy between the structure of plants and that of animals (and the fundamental difference in metabolism), the question whether crown gall is a cancer or not in the ordinary sense of the word would seem to be a difficult one to settle at this time; but Smith makes out a very strong case in favor of his view, and we must acknowledge that the view of the infectious cause of cancer in general is strengthened by his work.

THE ASSIMILATION OF FATS

Progress in the study of the metabolism of foodstuffs in the organism has shown that the chemical changes leading to a liberation of energy from the ingested nutrients are not so simple as was once supposed. Instead of merely accomplishing solution, the processes in the alimentary tract bring about extensive cleavage of the foodstuffs prior to their absorption from the gastro-intestinal canal. This profound disintegration of the ingested substances as a preparation for their subsequent rôle in the metabolism was scarcely suspected even a few years ago. It has long been obvious that the fats taken with the food, if not immediately required for the energy needs of the body, may be laid down without change in the adipose tissues as well as in the other cells of the body; but to state, as one recent writer does, that the mechanisms involved in the translation of fat from the alimentary canal to the tissues are of the simplest possible description, and involve changes only of hydrolysis and dehydrolysis, perhaps obscures some of the difficulties which the matter of fat transport presents.

Physiologists are now inclined to locate the actual metabolism of the foodstuffs, or their digestion derivatives, in the tissue cells. How and in what form do the products which undergo metabolism and contribute to energy exchange reach these cells? The carbohydrate travels as glucose in the blood stream. The amino acids derived from the proteins were once thought to be deaminized on their way into the general circulation; but more recent evidence indicates that they are actually carried as such in the blood and distributed widely in the organism.[1] The limitations of knowledge with regard to the transport of the fats to their depots and combustion centers may be veiled by saying that these foodstuffs are hydrolyzed within the intestine and resynthesized to a certain extent in the passage into the circulation. Part of the absorbed fat enters the thoracic duct as chyle and is thus discharged into the blood stream at the jugular vein. At least two thirds of the ingested fat may ordinarily be accounted for in that way; and this has furnished the justification for the belief in the resynthesis of neutral fat during the act of absorption from the intestine. Not all the reabsorbed fat is to be found in the chyle. The fate of the remnant is not clear. It may reach the blood stream directly by way of the intestinal capillaries and thus find its way to the liver; it may even be used up in the mucous epithelium of the alimentary canal.

Decidedly more uncertain are the details of the subsequent travel of the fats from the time they enter the blood stream until they reach that stage of chemical transformation which converts them into new and different products of metabolism. How the blood fat finds its exit from the blood, says Mathews,[2] how it gets through the vascular wall, whether by being split into soaps and glycerol or as a neutral fat, and how it is accumulated in the fat tissues, are problems not as yet solved. There is a lipase in the red blood corpuscles, and perhaps all the blood fat is rehydrolyzed before leaving the blood. Into this field of physiologic uncertainty the researches of Bloor[3] of the Harvard Medical School have brought new suggestions. He remarks that ever since the chemical similarity between lecithin and the fats was discovered, attempts have been made to connect the two in metabolism; but although there has been much speculation, no definite evidence has been offered. In fact, lecithin has been generally classed as a cytolipoid, having to do more with the structure of the cell than with its processes. However, the idea that there is a dynamic relation between lecithin and fat in normal metabolism has been a persistent one, and has continued to stimulate investigation, so that recently evidence has been brought forward definitely connecting the two. The evidence consisted of fat absorption experiments in which it was found that lecithin increased in the blood during the absorption of the fats.

Equipped with improved and refined methods of analysis to which he has of late devoted much atten-

4. Is Cancer of Infectious Nature? editorial, The Journal A. M. A., Aug. 19, 1911, p. 448.

1. The Paths of Absorption for Amino-Acids, Current Comment, The Journal A. M. A., July 5, 1913, p. 46; In What Form Are Protein Digestion Products Absorbed? editorial, Dec. 20, 1913, p. 2348; The Amino-Acids in the Blood, Current Comment, Feb. 21, 1914, p. 621; Amino-Acids and Tumor Tissue, Oct. 16, 1915, p. 1373. A valuable account of the behavior of the amino acids will be found by Underhill, F. P.: The Physiology of the Amino-Acids, New Haven, 1915.
2. Mathews, A. P.: Physiological Chemistry, New York, 1915, p. 453.
3. Bloor, W. R.: Fat Assimilation, Jour. Biol. Chem., 1916, xxiv, 447.

tion,[4] Bloor has attempted to locate the seat of formation of the lecithin. This substance is found unquestionably augmented in the blood while fat is being absorbed. During the course of this process it was found that total fatty acids increase in both plasma and corpuscles, but the increase is generally more marked in the corpuscles. Lecithin increases greatly in the corpuscles but only slightly in the plasma. No definite changes in the quantity of cholesterol were noted. A fairly constant relationship between total fatty acids and lecithin was noted in whole blood and corpuscles. This constancy, Bloor believes, may be taken as evidence that all the absorbed fat passes through the lecithin stage, and that therefore lecithin is to be regarded as the first stage in fat metabolism.

If it is justifiable to conclude that the blood corpuscles take up the fat from the plasma and transform it into lecithin, and that most if not all of the absorbed fat is so transformed, it follows from Bloor's standpoint that the hitherto unexplainable anatomic mechanism (thoracic duct) by which the fats are thrown directly into the blood stream and thoroughly mixed with the blood in the heart and lungs before they reach any of the organs of intermediate metabolism (as the liver) may be explained on the basis of the foregoing results. Since the first step in the metabolism of the fats takes place in the blood corpuscles, it is to be expected that they will be given an opportunity to take up as much of the fat as possible before it comes in contact with the organs and tissues.

Further interesting speculations of Bloor concern the unsolved question as to which of the blood cells —red or white — take the predominating part in this unique lecithin formation. It has long been known that during fat absorption the white blood cells in the intestinal lymph spaces become loaded with fat and apparently take an active part in the absorption, so that the idea would occur to many that the white cells were responsible for the lecithin increase in the blood. In view of the fact that they constitute less than 0.5 per cent. of the total blood cells, however, it would seem to be physically impossible for them to transform the relatively great amount of fat taken into the blood during a fat meal. It is quite unlikely, on the other hand, that the lecithin formation is limited to the blood cells. Esterases have been found in many tissues, and it is probable that the circulating fat is removed from the blood stream and worked up by many types of fixed cell in the same way as it is done by the blood cells.

Those who have followed the discussions of the recent physiology of the red blood corpuscles from time to time in THE JOURNAL must have been impressed by the rapid expansion of our information in regard to these cells, which were once merely regarded as more or less inert carriers of oxygen. Today we know them to be laden with sugar and amino acids, like other body cells; and now the evolution of the products of fat metamorphosis has likewise been discovered to constitute a presumable part of their varied functions.

4. Bloor, W. R.: Jour. Biol. Chem., 1915, xxiii, 317, and earlier papers.

A REPORT ON NUTRITION IN A GERMAN INTERNMENT CAMP

War, with its unexpected emergencies and unique demands, with the sudden needs of maintaining large groups of persons in health and strength under unanticipated conditions, has always presented serious problems of food supply and adequate nutrition on a large scale. The European nations are affording instances of this at the present time. The ingenuities and exigencies of nutrition have more than once been brought to light by a study of the management of civil populations in times of siege and in prison camps, as well as in the field. It is instructive to ascertain how unanticipated situations are met and what are the conditions that need to be combated in a nation left largely to its own limited resources in matters of diet in times of stress.

Particular value attaches, therefore, to observations by an unbiased, competent observer on the conditions of diet and nutrition in the camp of the interned British civilians at Ruhleben, Germany. The report submitted successively through the United States ambassadors at Berlin and London, to the British Secretary of State for Foreign Affairs, has been published as a white paper.[1] Its author, A. E. Taylor of the University of Pennsylvania, visited the camp, where he found a total number of 3,700 persons interned. As a criterion of what should constitute a complete, sufficient and normal diet for such persons, Taylor presents certain dicta which deserve to be repeated in view of their widespread significance, particularly at the present time:

1. The diet must contain protein sufficient in amount and representative in component amino acids to maintain the tissues and cells of the body in a state of normal composition and function. Taking into account the extensive investigation of the past few years on the protein requirement of man, it is stated that from 70 to 90 gm. of protein per day are fully competent to maintain normal nutrition in the adult male (not engaged in hard work), provided the proteins offer the body all the needed amino acids, and the diet is rich in carbohydrate.

2. The diet must contain an amount of fuel sufficient to furnish at least 30 calories per kilogram per

1. Report by Dr. A. E. Taylor on the Conditions of Diet and Nutrition in the Internment Camp at Ruhleben, received through the United States Ambassador, Miscellaneous, No. 18, 1916.

day. This fuel ought to be largely in the form of carbohydrate. The calories specified are needed for the body at rest or under light exercise only. If the body works, the input of fuel must rise to a value of 3,000 or more calories, depending on the severity of the work. This rule of the German authorities dealing with military prisoners runs at present to the effect that prisoners who work are to receive 10 per cent. more in calories than prisoners living in camp.

3. The diet must contain a certain amount of native fat. Extensive investigations in the nutrition of growing animals have indicated that a certain minimal fat content is indispensable in a diet. It is not known just how much fat is required to cover this factor, and we are therefore not in a position to fix the minimal fat content of a normal diet. Roughly speaking, it is believed that a ration should contain at least 25 to 50 gm. of fat per day. In justification for this conclusion, Taylor points out that quite possibly the indispensable factor in fat does not lie in the tripalmitin, tristearin and triolein therein contained, but in other components (whose nature is not yet clearly understood) which are present in the various native fats. General medical experience supports the view that nutrition is better maintained on protein, carbohydrate and fat than on protein and carbohydrate alone.

4. The diet must contain the various salts required in the body.

5. The diet must contain certain substances of unknown chemical nature which are at present grouped under the term "vitamins," and which are found especially in vegetables and in the coverings of grains. It is possible that the indispensable factor in fats previously discussed is to be classed with the vitamins, when considered from the standpoint of a diet.

6. A diet must not consist entirely of preserved or conserved foodstuffs. A certain proportion of the articles of diet ought to be either freshly cooked or consumed raw.

These conclusions, which are receiving widespread attention under the sanction of a British government report, are peculiarly interesting in the contrasts which they afford in several respects with what one might have expected to read a decade ago. Energy and sufficient protein no longer form the sole desiderata that receive emphasis. Suitable protein, accessories to the diet, salts, vitamins—in other words, the quality of the ration—is given special recognition by direct or implied reference. Taylor also takes into account further criteria of a diet which, as he says, are much more difficult to elucidate and evaluate than are the basal requirements already stated. In dealing with civilized man we are dealing with something more than the contemplation of the human subject as a living machine. Some account needs to be taken of the habits, customs, tastes and idiosyncrasies of the subjects under consideration, and to the degree of refinement or specialization of their nervous systems. The presentation of the physiology of nutrition is changing, indeed.

According to the British white paper, the minimum food requirements are satisfied in the Ruhleben camp. The British dislike the German cooking.[2] There is widespread dissatisfaction with the German "black bread" furnished to British palates, and other items are not relished; yet making due allowance for the exigencies of the war and the psychologic effects of restriction under military control, the nutritive conditions remain endurable. With one exception the different foodstuffs have been found to be of satisfactory quality. The estimate as to its quantity indicated that for the number of men who partook of the camp rations, the average daily input for the week was 99 gm. of protein, 25 gm. of fat, and 252 gm. of carbohydrate, corresponding to 2,740 calories. If all the men in the camp had taken their numerical share of the food offered, the average daily input per man would have been 60 gm. of protein, 13 gm. of fat and 308 gm. of carbohydrate, corresponding to 1,590 calories. It must be noted, however, that considerable supplies in addition are furnished by friends, relief societies and other agencies, so that the average figures will be above the minimum just quoted. The foremost criticism is that the food shipped in from Great Britain, like the food provided by the German authorities, is poor in fat and rich in starch.

Taylor's recommendations contain the suggestion that the two sets of supplies—from Germany and from Great Britain—should be organized to supplement each other. The proposed plan calls for from 80 to 90 gm. of protein, about 65 gm. of fat, and 425 gm. of carbohydrate, and would yield about 2,600 calories. Such a diet would contain the usual and desirable amount of fat, it would conform to the tastes of the prisoners, and it would provide the interned men with certain desired articles which the German authorities do not provide.

Current Comment

THE RÔLE OF BOOKS IN SPREADING INFECTION

Libraries and school authorities in cities that supply children with books from a common stock, as well as those who use such books, should be interested in a recent laboratory investigation of books as possible vehicles of disease.[3] In this investigation three approaches were made to the subject: (1) an investigation of seventy-five soiled and torn library books that for several years had been passing through the hands of children who were living under most undesirable sanitary conditions; (2) a search for diphtheria bacilli on 150 books that were known to have been handled by

2. See London Letter, this issue, p. 131.
3. Laubach, C. A.: The Possible Rôle of Books in the Dissemination of the Contagious Diseases, Bull. Johns Hopkins Hosp., 1916, xxvii, 183.

persons ill with diphtheria, and (3) a study of books artificially contaminated with *Bacillus coli, B. typhosus,* and *B. diphtheriae.* In the case of the seventy-five library books, the only organism found suggestive of danger was the colon bacillus, in two instances only; here the fact is pointed out that *B. typhosus* differs very little in viability from *B. coli* and would, if lodged on a book, persist almost equally long. The search for diphtheria bacilli on the 150 books handled by diphtheria patients failed to disclose the organism in a single instance. In this connection the investigator adds the results of a brief and inconclusive study of books open to contamination with tuberculosis to the results of a more extensive investigation by Kenwood and Dove,[4] quoting them as follows: "There is probably no material risk involved in the reissue of books recently read by consumptives, unless the books are obviously soiled. Even then the risks are slight." The books artificially contaminated by rubbing them, inside and outside, with cotton swabs saturated with broth suspensions of the organisms studied, were held at room temperature under various conditions: dry in diffuse daylight and moist in diffuse daylight; dry in darkness and moist in darkness; at low temperature, and exposed to direct sunlight. It was found that *B. coli, B. typhosus* and *B. diphtheriae* on the inside of books remained alive and virulent for months, and also on the outside of books when they were kept in the dark. Exposed to diffuse daylight, *B. typhosus* and *B. diphtheriae* survived not more than twelve days, while direct sunlight killed within a few hours. It is clear that while in the course of natural contamination books do not offer a favorable ground for the lodgment and growth of bacteria, yet in view of the fact that *B. typhosus* and *B. diphtheriae* have been found alive and virulent after the lapse of months under the conditions mentioned, it would be safest if books handled by patients were thoroughly disinfected. Direct sunlight appears to be as efficient and ready an agent here as elsewhere.

POLIOMYELITIS—INFANTILE PARALYSIS

Reports from New York indicate that that city is making desperate efforts to check a beginning epidemic of anterior poliomyelitis, probably the most severe in its onset of any that has threatened American communities. In the summer and fall of 1913 several groups of cases of this disease appeared in California. The field investigations were carried on by Sawyer,[5] who determined once more that this disease is transmitted by contact. It was impossible to show any connection between the stable fly—formerly incriminated—and the cases which he observed. In practically every instance infection could be explained on the theory that epidemic poliomyelitis is transmitted through contact from acute cases or carriers. He showed also that the active virus may leave the body from the rectum as well as from the nose and mouth. Precautions should be taken, therefore, in the care of poliomyelitis patients to prevent infection, not only from the nasal and buccal discharges, but also from the feces and soiled bedding. Recently Flexner[6] summarized his views as to the etiology of this condition. The microbic agent, he states, is present in the nasal and buccal secretions, carried by persons, not insects, and communicated by them in such a manner as to gain access to the upper respiratory mucous membranes of other persons. Those who are susceptible to the injurious action of the virus acquire the infection and develop the disease. Not all of them develop the paralytic or meningitic type. Some represent abortive and ambulatory types. All, however, become potential agents for the dissemination of the virus, as do also healthy persons who have been in intimate contact with those who are ill and others who have recovered from acute attacks of the disease. The prevention of such dissemination is the actual prevention of the disease. The treatment of the condition is at best unsatisfactory, and the restoration of function to paralyzed limbs is a difficult task.[7] To repeat, prevention of this dangerous and crippling disease should be the primary object.

RUSBY, A GOVERNMENT EXPERT, TESTIFIES

As might have been expected, the technical "experts" who came to the defense of Wine of Cardui were, with but few exceptions, men of little or no standing in their professions. One of the exceptions was Dr. Henry H. Rusby of New York. Rusby is a government official connected with the Department of Agriculture. Some of our readers will remember him as the man whose employment was discussed in the so-called Wiley investigation. This investigation went into the facts regarding the retaining of Rusby in the government service at a higher rate of remuneration than the law allowed, and Dr. Rusby's suggestion that while he was on his vacation Dr. Mansfield should be employed by the government as an unskilled laborer at $50.00 a month to do his (Rusby's) work. Dr. Rusby's exoneration in this case is, of course, a matter of record and was commented on in these pages. This by the way. For the present we would direct our readers to the testimony of Dr. Rusby in the Wine of Cardui case.[8] Dr. Rusby is a pharmacognosist. His ability as a medical botanist few will question. Apparently, however, he was willing to qualify also as a physician, although his experience in the practice of medicine seems practically to have been limited to one year's employment as clinical clerk in a lunatic asylum some thirty years ago. This may help to explain Dr. Rusby's weird conceptions of the anatomy of the female pelvis. Dr. Rusby was quite sure that Wine of Cardui would be "useful" as a "diuretic," as "a stimulant of intestinal action," as "a tonic and appetizer," as "beneficial to nutrition," and, last but not least, as "a stimulant to unstriped muscular fiber." Dr. Rusby regarded such a mixture "as a uterine tonic" whose action would be

4. Kenwood, H., and Dove, E.: The Risks from Tuberculosis Infection Retained in Books, Lancet, London, 1915, ii, 66.
5. Sawyer, W. A.: Epidemiologic Study of Poliomyelitis, Am. Jour. Trop. Dis. and Prev. Med., September, 1915.
6. Flexner, Simon: Mode of Infection and Etiology of Epidemic Poliomyelitis, Am. Jour. Dis. Child., May, 1915, p. 353.
7. Therapeutics, this issue, p. 118.
8. See page 135, this issue.

"beneficial" in its general tendency "by increasing the nutrition of the muscles and toning the muscles up so that they would support the uterus better." It was brought out on cross examination that Dr. Rusby was quite convinced that Wine of Cardui would act on the unstriped muscular fibers of the broad ligament! During the investigation of the Expenditures in the Department of Agriculture a letter of Dr. Rusby's was put in evidence in which he deplored the fact that he had "only the degree of M.D." In the same letter he stated that while he "never suggested such a thing nor even considered it," he had no doubt that he could "secure a degree from Columbia University" if it seemed "important from a departmental point of view." It might be suggested that when Dr. Rusby gets back to Columbia University, where he is professor of materia medica in the College of Pharmacy, he ask a freshman student in the anatomy class to make a dissection of some of the unstriped muscles in the broad ligament.

Medical News

(Physicians will confer a favor by sending for this department items of news of more or less general interest; such as relate to society activities, new hospitals, education, public health, etc.)

ILLINOIS

Soldier Medical Students Allowed Credit.—The Illinois State Board of Health is said to have ruled, June 26, that all medical students who join the Illinois National Guard or Naval Reserve will be allowed full credit for the year's work.

Northwestern Alumni Meet.—At the annual meeting of the Alumni Association of Northwestern University Medical School, held in Chicago, June 10, Dr. James H. Stowell, Chicago, was elected president, and Dr. Henry B. Hemenway, Evanston, vice president. The association recommended that a medical alumni advisory board be established to investigate conditions in the medical school.

Personal.—Dr. Cora I. Kipp, Pontiac, has recently returned after five years' service in Bareilly and Brindaban, India.——Dr. Howard K. Scatliff, Elgin, is ill with smallpox at the Sherman Hospital.——Dr. Henry A. Winter, Saybrook, celebrated his fiftieth anniversary of his entrance into practice, June 23.——Dr. Joseph Pogue, Edwardsville, who has been ill with pneumonia, is convalescent.

Sanatorium Opened.—The Rockford Municipal Tuberculosis Sanatorium was formally opened, June 10. Addresses were delivered by W. H. Smith, Rockford, on "The Relation of the Doctor to Community in the Prevention of Tuberculosis," and by Dr. George W. Webster, Chicago, on "The Rights and Duties of the Municipality in the Control of Tuberculosis." The presentation speech was made by Dr. Daniel Lichty, its president, and Mayor Bennett accepted the institution on behalf of the city.

Infantile Paralysis.—Four cases of infantile paralysis were discovered in the Italian quarter of Standard, Putnam County, July 4. Steps were immediately taken to avoid the spread of the disease, and an investigation was started to trace the source of infection. Dr. C. St. Clair Drake, secretary of the state board of health, believes "that investigation will establish the fact that the outbreak of infantile paralysis among the Italians in both New York and Illinois, is more than mere coincidence."

Chicago

Physicians' Club Election.—The Physicians' Club of Chicago, at its annual meeting, June 29, at the Hotel Sherman, elected Dr. William D. Napheys as secretary. The directors elected for two years are Drs. Arthur M. Corwin, Henry W. Cheney and John Weatherson. The holdover directors are Drs. Joseph Zeisler, Charles P. Caldwell and Henry T. Byford.

On Watch for Infantile Paralysis.—To guard against the entrance of infantile paralysis, which is epidemic in New York, into Chicago, the health commissioner, July 4, withdrew eighteen physicians of his staff from field work and placed them on duty to watch incoming trains from the east which might carry cases of the disease. No cases had been reported when night came, but one family was placed under observation. All babies on incoming trains who remain in Chicago will be watched for at least two weeks. Plans have been made for a survey of the entire city for cases of infantile paralysis.

Personal.—Dr. Arthur Lederer has resigned as chief chemist and bacteriologist of the sanitary district of Chicago, to take up the course for health officers at Harvard-Technology, Boston.——The first five names on the eligible list of the City Civil Service Commission for attending physician at the Municipal Tuberculosis Sanatorium are Drs. William D. Napheys, Arrie Bamberger, Harry G. Hardt, Ellis B. Freilich and Philip J. Murphy.——Dr. Hugh Neil MacKechnie has been appointed head of the department of surgery of Loyola University Medical School, vice Dr. John D. Robertson, resigned.

IOWA

Personal.—Dr. Max W. Emert, Des Moines, has been appointed assistant in surgery of the University of Nebraska and has located in Omaha.——Dr. Oliver W. Boatman has succeeded Dr. Edward J. Wehman as city physician and health officer of Burlington.

New Member of National Board.—At its business meeting, held in Detroit, June 14, the National Board of Medical Examiners elected Dr. Walter L. Bierring, Des Moines, as a member of the board to fill the vacancy caused by the death of Dr. William L. Rodman.

Clinical Society Organized.—June 6, the Iowa Clinical Medical Society was organized at Des Moines by men interested particularly in internal medicine and diagnosis. The following officers were elected: president, Dr. Granville N. Ryan, Des Moines; vice presidents, Drs. C. Palmer Howard, Iowa City, and John W. Shuman, Sioux City, and secretary-treasurer, Dr. Guthrie McConnell, Waterloo. The next meeting will be held in Sioux City, September 2.

KANSAS

Hospital Officials Meet.—At the annual meeting of the Kansas Hospital Association, the following officers were elected: president, Dr. Samuel Murdock, Jr., Sabetha; vice presidents, Drs. Frank W. Shelton, Independence; John C. Hall, McPherson, and George W. Jones, Lawrence, and secretary-treasurer, Dr. William R. Dillingham, Halstead.

Personal.—At the annual meeting for organization of the Kansas Board of Medical Registration and Examination at Topeka, June 14, Dr. George M. Gray, Kansas City, was elected president, and Dr. Henry A. Dykes, Lebanon, was reelected secretary.——The orders directing Lieut. John W. Turner, M. R. C., U. S. Army, to Fort Sam Houston, take away the last medical officer from Fort Riley, and Dr. John E. Hewitt, M. R. C., Wakefield, has been ordered to report for duty at Fort Riley.——At the annual meeting of the state board of health, Dr. Charles H. Ewing, Larned, was elected president, and Dr. Samuel J. Crumbine, Topeka, was reelected secretary for four years. The advisory board, composed of Dr. Sara E. Greenfield, Topeka, bacteriologist, and Prof. C. A. Haskins, engineer, and Joseph Welker and Francis Veatch, both of Lawrence, assistant engineers, were also reelected.——Dr. John W. Young, Hutchinson, sailed with his family from San Francisco for Manila, June 10. He will be engaged in medical missionary work in the Philippines for three years.——Dr. Oscar F. Marcotte, Topeka, has succeeded Dr. John H. Rinehart, resigned, as coroner of Shawnee County.

MARYLAND

Hopkins Seeking Land.—A large block of property immediately east of the present buildings is being sought by the trustees of the Johns Hopkins Hospital for extension of the hospital. The ground is to be utilized for new buildings made necessary by the recent Rockefeller Foundation gift for hygiene research and by other gifts and legacies.

University of Maryland Men Control Medical Corps.—The regimental hospital corps of the Maryland National Guard is composed entirely of graduates of the University of Maryland, as follows: Majors Robert P. Bay, S. Griffith Davis, Jr., J. Harry Ullrich, all of Baltimore, and Henry A.

Mitchell, Elkton. Captains G. Milton Linthicum, Herbert Schoenrich, Frederick H. Vinup, William H. Daniels, William J. Coleman, Baltimore; Jacob C. Madara, Ridgely; Clarence P. Erkenbrack and John C. Stansbury, Baltimore. Lieutenants Paul Hutton, Charles W. Rauschenbach, May; George W. Rice, John S. Fenby, William R. Johnson, Caldwell Woodruff, Hyattsville, and Louis Diener.

Personal.—Dr. Henry Lee Smith, Baltimore, a member of the Medical Reserve Corps of the United States Army, has been ordered to Mount Gretna, Pa. He will be one of the medical officers to examine the Pennsylvania troops.——Dr. L. Palmer Holmes, chief admitting physician to the Johns Hopkins Hospital, has left for a month's vacation in Arizona and San Antonio, Texas, where he will visit the United States Army headquarters.——Dr. George G. Snarr has been reappointed medical superintendent of the Franklin Square Hospital, Baltimore.——Dr. Charles R. Foutz has has been appointed health officer of Westminster.——Dr. Frederick N. Tannar, Baltimore, who was operated on at the Franklin Square Hospital recently, is reported to be convalescent.

Base Hospital Forming.—In the event of war, the American Red Cross and the Maryland War Relief Auxiliary have agreed on the immediate need of the establishment of a base hospital. The staff of the hospital has been completely organized. The surgeons, physicians, nurses, orderlies and litter bearers, etc., have all been recruited in Maryland, the total number required to man the unit being approximately 250 persons. All that is lacking is the equipment, and to provide this, it will require about $30,000. The personnel of the staff is as follows:

Dr. Winford H. Smith, Baltimore, director; Dr. George H. Walker, Baltimore, adjutant; Dr. Victor F. Cullen, State Sanatorium, quartermaster; Dr. Walter A. Baetjer, Baltimore, register; and Miss Bessie Baker, superintendent of nurses.

Surgical Division: Dr. John M. T. Finney, surgeon-in-chief; Dr. William S. Baer, Dr. William A. Fisher, Jr., Dr. J. Staige Davis, Dr. Henry N. Shaw, Dr. George J. Heuer and Dr. Bertram M. Bernheim, assistants, all of Baltimore.

Medical Division: Dr. Theodore C. Janeway, Jr., physician-in-chief; Dr. Paul W. Clough, Dr. Charles M. Byrnes, Dr. Eveleth W. Bridgman, Dr. John H. King, Dr. William M. Happ and Dr. Verne R. Mason, all of Baltimore.

Laboratory Division: Dr. Thomas R. Boggs, chief.

Roentgen-Ray Specialist: Dr. Charles A. Waters.

Pathologist: Dr. Montrose T. Burrows.

Dentist: Dr. A. P. Dixon, Cumberland, Md.

Pharmacists: Dr. D. P. Craumer and W. M. Rodgick.

Chaplain: Rev. Dr. John McDowell.

MONTANA

Tuberculosis Association Organized.—The Montana Association for the Prevention of Tuberculosis was organized at a meeting held in Helena, June 23, at which addresses were made by Charles M. DeForest, field secretary of the National Association for the Study and Prevention of Tuberculosis, and P. A. Surg. A. J. Lanza, U. S. P. H. S., who is making a tuberculosis survey among miners of the state——The Butte Tuberculosis Society filed articles of incorporation, May 24.

Hospital News.—The movement has been organized for the construction of the Butte Deaconess Hospital to cost $100,000. The hospital will be for the public and an advisory board of physicians of the city will be maintained.——Before August 1, a hospital pavilion at the State Sanitarium, Galen, will be ready, which will accommodate thirty additional patients. Work will be started in the near future on a new kitchen and dining room for the new institution.——Work has been started on the construction of the new hospital for Custer County which is to be built at a cost of about $40,000. The hospital will contain thirty rooms.——A contract has been awarded for the erection of a thirty-room hospital in Conrad, to cost about $13,000. The building will accommodate, when completed, about fifty patients and will be in charge of Dr. Henry W. Powers.——A new private hospital is to be built in Anaconda with accommodations for thirty patients.

NEW YORK

Personal.—Dr. Franklin W. Barrows, Buffalo, has been appointed acting chief of the Bureau of Child Hygiene, Department of Health, during the absence of Dr. Arthur C. Schaefer, who has been called to duty with the Seventy-Fourth New York Infantry.——At the meeting of the Binghamton Academy of Medicine, June 19, a loving cup was presented to Dr. John H. Martin, by the Academy, as a token of respect and affection.——Dr. Charles J. Garofalo, Syracuse, has been commissioned captain in the Canadian Army Medical Corps, and has reported for duty at Kingston, Ont.

New York City

Sore Throats Among Guardsmen.—It is reported that fifteen privates of Company L, Forty-Seventh Regiment of Brooklyn, are ill with sore throats and have been isolated in the regimental hospital.

Personal.—At the annual commencement exercises of the University of Michigan, June 29, the honorary degree of Master of Arts was conferred on Dr. James Riddle Goffe.——Three medical inspectors of the Bureau of Child Hygiene have answered the call of duty. These are Maj. John F. Dunseith and Edward R. Maloney, and Capt. James G. Dunseith.——Dr. Carroll Chase, Brooklyn, sailed for Paris, June 4. He went for hospital service under the auspices of the American Relief for France and Her Allies.——Dr. Montgomery E. Leary, Rochester, was reelected president of the New York State Sanitary Officers' Association at the recent meeting of that organization in Saratoga.——Dr. and Mrs. Fred H. Albee have sailed on the St. Paul for Liverpool.——Dr. Francis R. Holbrook arrived home from Europe on the French Liner *Lapland*.

Another Base Hospital Fully Equipped.—Edward B. Close has placed $50,000 at the disposal of Dr. Samuel Lloyd of the Post-Graduate Hospital for the purpose of organizing and equipping a 500-bed base hospital to be used in case of war with Mexico. The complete personnel of the hospital will consist of 200 men, and volunteers are wanted for hospital orderlies who are accustomed to the work and in proper physical condition. Dr. Lloyd will be the director. The remaining members of the staff, all from the Post-Graduate Hospital, are: Drs. John J. Moorhead, Ward J. MacNeal, James F. McKernon, Frederick S. Lobell, Stanley R. Woodruff, George Francis Cahill, Francis C. Ligouri, Walter J. Wellington, Robert B. Beard, Marshall C. Pease, Jr., Henry R. Kutil, Blake F. Donaldson, Lawrence J. Nacey, Frank K. Pomeroy, James Francis Sullivan, Richard M. Taylor and the Rev. Duncan H. Browne.

The Spread of Infantile Paralysis.—July 1, there were reported fifty-one new cases of infantile paralysis and eleven deaths. July 3, sixty-seven new cases were reported. July 4, twenty-five deaths from infantile paralysis were reported for the previous twenty-four hours. Fifty-nine new cases and thirty-one suspects were reported from four municipal boroughs. Since June 10 there have been 327 cases reported in Brooklyn, with a mortality of about 20 per cent. In speediness of spreading the epidemic has already passed the record of 1907. A house to house canvass is being made in Brooklyn. The known cases are, for the most part, confined to the Italian population. Officials of the sanitary bureau are making a survey of the areas where infantile paralysis is most prevalent, to determine whether the stable fly is responsible for the recent outbreak of the disease. The groups of cases in Brooklyn and Queens are roughly divided into four areas. A special field force has been organized in Brooklyn under the charge of Dr. Simon R. Blatteis, Brooklyn. The premises where infantile paralysis exists will be placarded, and when complete isolation and proper nursing cannot be maintained at the homes, the patient will be removed to a special pavilion at the Kingston Avenue Hospital, where a special visiting staff of experts, including specialists in children's diseases, orthopedics and neurology, are assisting the regular attending staff. The department calls attention to the importance of the highest possible degree of cleanliness in the home and of the patient. In the orders issued June 30, the local health officers of Orange, Rockland, Putnam, Westchester, Nassau and Suffolk counties were instructed to report by telegraph every suspected case of infantile paralysis and enforce the strictest quarantine of the patient. The health officers are also urged to give the widest possible publicity to the order and in the case of an epidemic to issue special bulletins so that the people may be informed of the dangers. The epidemic originated in the tenement population in Brooklyn, and has spread to three of the five boroughs of greater New York. In one day forty-four new cases were reported, and up to June 30 there have been sixty-four deaths. The department of health has enlisted the services of two large life insurance companies to aid in the distribution of warning leaflets, and the distribution of one-half million such leaflets, printed in yellow, the quarantine color, has been begun. There are now 153 cases of infantile paralysis at the special pavilion of the Kingston Avenue Hospital. A special staff of experts to care for these patients has been organized with Dr. Lewis C. Ager as chief. Associated with him are Drs.

Eugene F. Dalton, Murray B. Gordon, Judson P. Pendleton, and Philip W. T. Moxom, who are experts in contagious diseases; Dr. Robert O. Brockway, a nerve specialist, Dr. Walter Truslow, orthopedic surgeon and Dr. Alexander Sophian, a laboratory expert. At the present time the field staff, working under the general direction of Dr. Blatteiss, consists of thirteen physicians, thirty nurses and twenty sanitary inspectors. In addition to this, Mr. Lucius P. Brown, director of the bureau of food and drugs, has detailed twenty-five of his men to inspect and clean up all places where food is handled or sold. The department announces that the free open air moving picture shows which it had planned to hold in Manhattan, the Bronx and Brooklyn, during the middle of July, would not be given since it would be impossible to prevent a gathering of large crowds of children to view the pictures. At the request of Commissioner Emerson the department of licenses has notified all motion picture theaters in the city not to admit children under 16 from July 5 until such time as the board of health declares this health menace at an end.

PENNSYLVANIA

Soldiers Inoculated.—The entire National Guard of this state encamped at Mount Gretna have been inoculated with typhoid vaccine preparatory to their removal to Mexico.

Advisory Board for Sanatorium.—Mayor Armstrong of Pittsburgh announces that he will appoint an advisory board for the tuberculosis hospital on the Leech farm, of which Dr. H. G. Burns of the Bureau of Infectious Diseases is at present in charge.

New Hospital for Pittsburgh.—Plans have been posted for the new Mercy Hospital building, to cost $500,000. The building is to be eight stories in height, 100 by 250 feet, and is to be built of brick, terra cotta, reenforced concrete and steel.

Personal.—Dr. Charles M. Stephens, York, has gone to Waycross, Ga., where he is a member of the staff of a railway hospital.——The degree of LL.D. was conferred on Dr. Samuel Z. Shope, Harrisburg, by Lebanon Valley College, June 16.——The degree of Doctor of Science was conferred by Lafayette College, Easton, on Dr. Samuel G. Dixon, state health commissioner, June 14.

Philadelphia

Hospitals Offer Aid.—Practically all the institutions of Philadelphia have announced their readiness to take care of the sick and wounded of the army and navy, and the authorities at Washington have been notified of the action of the hospital officials.

Tribute to Dr. White.—In the London *Spectator* an eloquent tribute appears to the memory of Dr. James William White, who died April 24. The tribute closes with "We shall do well if in reckoning up the toll of those who gave their lives for freedom, we do not omit from our list the name of William White."

Hospital Unit Formed.—Physicians on the staff of the University Hospital have organized a hospital unit for service in the United States Army, and have notified the Southeastern Pennsylvania branch of the American Red Cross that they are ready to respond on call. The university unit, if called, will be assigned to take charge of a base hospital, and will be thoroughly equipped. Dr. Edward Martin is director of the unit and among the members of the staff are Drs. John B. Deaver, Alfred Stengel, George Edmund de Schweinitz, Allen J. Smith, Eldridge L. Eliason, Joseph Sailer, M. Howard Fussell, Charles H. Frazier and George P. Muller.

Philadelphia Physicians Go with Troops.—Five young physicians serving as interns at the Philadelphia Hospital have joined the health department of the National Guard, and will go to the Mexican border with the Pennsylvania troops. The doctors enlisted on June 21, and it is said that they will serve in various field hospitals. Those who joined the guard from the Philadelphia Hospital are as follows: William T. Lineberry, James W. Doughty, Joseph G. Fernbach, Stuart E. Trowbridge and H. Freeman Warren. Dr. Charles B. Kendall, also an intern at the hospital, has been a member of the guard for two years, and will join the Second Field Hospital Corps.

Personal.—Daniel Lincoln Wallace had conferred on him the degree of Doctor in Chemistry by the University of Pennsylvania, June 21, and on the same day Dr. Charles Karsner Mills was given the honorary degree of LL.D.——Dr. S. Lewis Ziegler has been elected trustee of Bucknell University, Lewisburg.——Dr. Pierre N. Bergeron and Dr. Frank D. Harris have been appointed gynecologists-in-chief to St. Mary's Hospital.——Dr. Royal H. McCutcheon of the Methodist Hospital staff has enlisted with the Pennsylvania National Guard in the Hospital Service.——Dr. Edward K. Tullidge, who recently returned from the Balkans, has been appointed lieutenant-surgeon in the National Guard.

New Health Centers.—There has been appropriated $25,000 by councils for baby saving work during this summer. Director Wilmer Krusen of the department of health and charities will establish four health centers for mothers and babies in place of the single one held heretofore in the Second Ward. The centers will be located in the Sixteenth Ward with subcenters in the Eleventh, Twelfth, Thirteenth, Eighteenth, Thirty-Sixth and First wards. The appropriation provides for the renting of houses, purchase of tents, use of vacant lots, and milk and ice for poor babies and their families. Each center will have a woman physician, a sanitary inspector, and fifty-eight nurses will be distributed throughout these centers.

GENERAL

Pure Milk Experts Meet.—At the annual meeting of the American Association of Medical Milk Commissions, held at the Cincinnati General Hospital, June 10, Dr. Walter D. Ludlum, Brooklyn, was elected president; Dr. Otto P. Geier, Cincinnati, secretary (reelected); William J. Graf, Cincinnati, assistant secretary; J. P. Sedgwick, Cleveland, treasurer, and Henry F. Price, Pittsburgh, member of the council.

National Board Examination.—The National Board of Medical Examiners announce that its first examination will begin, October 16, at the Army Medical Museum, Washington, D. C., and will continue for one week. No charge is made for the examination itself, but a registration fee of $5 is required. Further particulars may be obtained from the secretary of the board, Dr. John S. Rodman, 2106 Walnut St., Philadelphia.

Red Cross Hospitals for Border.—The Chicago chapter of the Red Cross is raising a fund of $200,000 to be used for the creation and operation of four base hospitals on the border and four hospital columns on lines of communication with troops. These hospitals and columns will be fully equipped and will have a full complement of physicians, nurses and all necessary assistants. The chapter will also purchase supplies for wounded men and for troops; will care for the dependent families of national guardsmen and will maintain a general fund for miscellaneous needs occasioned by war.

American Hay-Fever-Prevention Association.—At the annual meeting of this organization, held in New Orleans, of which brief mention was made in The Journal last week, it was reported that thirty-four state boards of health, including Louisiana, Mississippi and Alabama, are cooperating in the campaign against hay-fever, and that the United States Public Health Service has placed the Hygienic Laboratory at Washington at the disposal of the organization for scientific investigations and has now published an illustrated list of the most common hay-fever weeds. The research department of the association has completed a list of hay-fever weeds for the southern, middle and eastern states and is now making arrangements to complete a similar list for the western and Pacific states.

Military and Civilian Relief.—The relief work of Red Cross chapters is divided into a section for military relief and one for civilian relief. The first section takes charge of the collection, purchase, warehousing, packing and forwarding of supplies to soldiers and sailors. The section for civilian relief has charge of all work pertaining to the relief of destitute families of soldiers and sailors. Care is especially requested in the collection of reliable information, in the proper distribution of relief, the avoidance of haphazard, spasmodic and irregular methods, and discrimination as to whether relief should be in the form of money or supplies. The chapters of the Red Cross are authorized to solicit contributions of money or supplies and to spend or distribute these funds and supplies under proper safeguards, accurate account being made of all monies received and expended.

The Mobilization Camp Personnel.—The following are the changes and additions to the list of officers on duty at mobilization camps in the Central Department: Ohio, Capt. Frank Winders, M. C., U. S. Army; Lieut. Charles F. Bowen, M. R. C., U. S. Army, Columbus. Minnesota, Capt.

Will L. Pyles, M. C., U. S. Army, in place of Maj. George H. Crabtree, M. C., U. S. Army; Capt. Thomas H. Johnson, M. C., U. S. Army. Michigan, Lieut.-Col. Charles L. Willcox, M. C., U. S. Army, in place of Maj. James L. Bevans, M. C., U. S. Army; Capt. Charles E. Freeman, M. C., U. S. Army. Indiana, Capt. Arthur M. Whaley, M. C., U. S. Army, and Lieuts. John J. Boaz, Harvey A. Moore, Edmund D. Clark, and Orange G. Pfaff, M. R. C., U. S. Army, all of Indianapolis. Nebraska, Capt. Ernest R. Gentry, M. C., U. S. Army, in place of Capt. Charles F. Craig, M. C., U. S. Army.

Bequests and Donations.—The following bequests and donations have recently been announced:

For the completion of the fourth base hospital of the American Red Cross in New York, a donation of $10,000 from Mrs. Willard D. Straight.

St. John's Guild and Lincoln Hospital, New York, each $100,000, and New York Orthopedic Hospital, $50,000, by the will of Mrs. Helen Gaillard.

St. Luke's Hospital, New York, $10,000, by the will of Waldron Post Brown.

St. Mary's Hospital, Milwaukee, $2,000, by the will of Antoinette Worman, and also unless the contest to the will proves successful, about $350,000 as a fund for the establishment of free medical dispensary service in Milwaukee.

St. Luke's Hospital (Chicago) building fund, donation of $100,000, by Mrs. George M. Pullman.

Albany Medical College, $12,635.20, by the will of Dr. John M. Bigelow, and donations of $41,000 from five citizens of Albany to meet the deficit of the running expenses.

Medical Preparedness.—Prompted by the considerations that the medical profession in peace and in war has always been ready to serve the best interests of the government out of a spirit of patriotism and cooperation; that the European war has demonstrated the need of greater medical supplies and more efficient organization of medical resources in connection with war activities than was formerly deemed necessary or adequate, and that every United States soldier and sailor is entitled at all times to protection in sanitary matters and to proficient medical and surgical care, a committee including representatives from the principal medical organizations has tendered to the existing agencies of the government its services toward the medical welfare of the army and navy. These services comprise the establishment of an organization to make a comprehensive survey of the resources of the government; the invoicing of the resources available in peace and in the emergency of war, including the names of men available for field or home duty, who are trained in medicine, surgery and sanitation, the equipment of the hospitals with which these men are connected, the buildings available for hospital use; the facilities for transportation of the wounded, food and drug supplies available, lists of trained nurses and other hospital helpers, and to aid in the care of the sick and wounded and the elimination of preventable diseases. A committee of twenty-nine was formed, of which Dr. William J. Mayo, Rochester, Minn., was made chairman, and Dr. Frank F. Simpson, Pittsburgh, secretary of the advisory committee. The general committee has selected a subcommittee in each state to aid in the general survey of the medical resources of the country. The national committee is composed of three honorary members, the surgeons general of the army, navy and Public Health Service; six ex-officio members, Col. Jefferson R. Kean, M. C., U. S. Army, and the presidents of the American Medical Association, American Surgical Association, Congress of American Physicians and Surgeons, Clinical Congress of Surgeons of North America and American College of Surgeons; thirty members appointed by the foregoing and a number of associate members representing important subjects closely allied to medicine. In addition there are state committees of nine members each, and territorial committees of three members each and a number of aides for local work. The committee will endeavor to interest the medical profession of the country in the desirability of applying for commissions in the Officers' Reserve Corps, Medical Department. By a mutual understanding between the committee and the American Red Cross, the organization will cooperate with the Red Cross in raising its civilian and military work to a high point of efficiency and in organizing a considerable number of Red Cross hospital units in strict accord with the most recent advances and the highest ideal of medicine. Up to the present time lists of 21,000 physicians have been made out, thus making a sufficient force to care for 3,000,000 soldiers on the basis of seven commissioned medical officers to each 1,000 men.

LONDON LETTER

LONDON, June 10, 1916.

The War

WASTAGE OF MEDICAL OFFICERS IN THE ARMY

The authorities are always insisting on the need for more medical officers in the army. It is plain that several forms of wastage exist at present. The wounded could be run straight in by motor from the advanced dressing stations to the casualty clearing hospitals, without any necessity for stopping at the intervening "field ambulances," which indeed might be done away with altogether, setting free thirty doctors in each division for more useful work. The plan which makes each division a self-contained medical unit works out as an impediment, instead of a help, to efficiency, for in a battle, when a division moves out of action, its field ambulances move out with it, and lend no help to any other unit. The wastage of physicians due to this arrangement is great, and for every one division in action, two, or more than two, are kept in reserve, and the medical officers belonging to them are for the time being standing idle. If, instead, each army were taken as the unit, then the physicians belonging to this large unit would never be out of action, but constantly available to be sent where they were most needed (except when off duty). Again, physicians' services should not be thrown away on mechanical or purely clerical work, which could be done just as well by men not trained in medicine. Special skill ought to be utilized as far as possible, and medical students employed not as combatants, but as dressers. A great wastage of medical services is caused by appointing the full complement of physicians to serve on the field ambulances of the great army in training at home, and as these doctors are already trained in their profession, they are not needed until the new army is nearly ready to go abroad. No doubt these reforms will be made in time. Our national character is too conservative for rapid reforms. We are, too, so empiric that, as the whole history of the war shows, we do not work by schemes carefully thought out beforehand, but improve as we go along and defects are disclosed.

THE FEEDING OF BRITISH PRISONERS IN GERMANY

Some time ago your Berlin correspondent described the feeding of prisoners in Germany, giving the number of calories allowed and implying that conditions were satisfactory. Unfortunately the evidence is overwhelming that the feeding of British prisoners is far from this. If independent evidence were necessary it is furnished by the report made by Dr. A. E. Taylor, an American physician, through the United States ambassador in Berlin, on the feeding of British subjects interned at Ruhleben. It is published as an official document by the British government. Dr. Taylor lays down what he considers to be a minimum diet for an adult male not engaged in hard work, the figures being supplied largely by German investigators. This consists of protein from 70 to 90 gm. a day, carbohydrate to a value of 3,000 or more calories a day depending on the work done, at least 25 to 50 gm. of fat a day, salts and vitamins, that is, substances found in fresh food and known to be essential to life. This minimum is looked on as enough to keep a man nourished "like a machine." It omits the vital questions of variety and choice and taste altogether. Dr. Taylor surveyed the prisoners' diet during seven days, and he comments as follows: "If all the men in the camp had taken their numerical share of the food offered, the average daily input per man would have been 60 gm. of protein, 13 gm. of fat, 308 gm. of carbohydrate corresponding to 1,590 calories." Happily all the men did not ask for their rations, and so those who did ask got a trifle more. This, however, is the conclusion: "It is equally clear that the food provided and served during the week of the survey was not sufficient in any direction to provide nourishment for the 3,700 men concerned, had they been entirely dependent on it. Fresh fish was served on three days of the survey. On one day the quantity was sufficient, but on the first and third days the supply ran out with 100 and 250 men still in line. These men were then provided with tinned fish, which many of them refused." The refusal is not surprising in view of the following: "The camp possesses a stock of *Bratháring* in large tins. On one occasion I witnessed the opening of seventeen of these tins. Five were distended with gas which rushed out when the tins were punctured. The contents of these tins were found to be in a state of advanced putrefaction. The contents of the other tins were not putrefied, but could not be regarded as in a satisfactory condition. I believe that this lot of herring should be condemned."

HOSPITAL WORK FOR WOMEN PHYSICIANS

At several of the large hospitals in London the calling up of the remaining members of the medical and lay staffs who are of military age will make it difficult to carry on the work efficiently. Wherever women can take the places of men they are being employed, but some of the duties in hospitals cannot be performed by women. Appeals are being made to the tribunals for exemption for dispensers and other servants who cannot be replaced. Before the war there were practically no women dispensers at the hospitals. Now a woman dispenser is engaged at the First London General Hospital, however, and two are to be installed at the London Hospital next month. For clerical work, women are now employed in all the hospitals. The chief difficulty in regard to the medical staffs arises through the dearth of resident officers. The present practice is that when a student has qualified for appointment he receives an honorary commission, and stays for about three months at the hospital before passing on to military service.

Sir Frederick Treves, speaking at the fourth annual meeting of the association and governors of the South London Hospital for Women, whose new premises will be opened by the queen, July 4, said that a feature of this hospital which was most striking and commendable was that it was staffed by women. What might be the full extent of the work of the woman physician it was impossible to foretell; but obviously her first efforts should be directed to the treatment of women and children. He regarded the battle of the woman physician as ended. Until a few years ago her greatest need had been opportunity. This the war had afforded, and she had taken advantage of it admirably. No one could dispute that the manner in which the woman physician had taken her place in the medical work connected with the war was beyond praise. One thing still needed before the woman physician could be said to have come into her own was the opportunity of hospital practice.

PARIS LETTER

Paris, June 8, 1916.

The War

AN ASSOCIATION OF RED CROSS PHYSICIANS

A society has just been founded under the provisional title "Reunion amicale et scientifique des médecins et chirurgiens des hôpitaux auxiliaires," or "Social and Scientific Reunion of the Physicians and Surgeons of the Auxiliary Hospitals." This society will concern itself with all questions interesting its members as physicians and surgeons of the Red Cross.

Appendicitis and Syphilis

Dr. Gaucher, clinical professor for diseases of the skin and syphilis at the Faculté de médecine de Paris, read a communication before the Académie de médecine in which he sought to prove that appendicitis and enterocolitis are very nearly related to syphilis. He stated that this disease is always found in the history of those who suffer from the first two, especially in their family history. This expression of opinion gave rise to strong objections. Dr. Jalaguier of the Faculté de médecine de Paris and surgeon of the hospitals stated that he had made an investigation, as the result of which he is absolutely convinced that there is no pathogenic relation between appendicitis and syphilis, either congenital or acquired. Appendicitis may occur in a syphilitic person as it may occur in a tuberculous patient; but while tuberculous lesions have been observed in appendicitis, Jalaguier does not believe that typical syphilitic changes have ever been demonstrated in the appendix. Dr. Routier, surgeon of the Paris hospitals, agrees with Jalaguier that it is not safe to follow Gaucher's conclusions. He has performed a great number of operations for appendicitis, but he has never found any relation between appendicitis and syphilis. There does not, in his opinion, exist a syphilitic appendicitis amenable to specific treatment. Professor Quénu supported Dr. Jalaguier and pointed out that, to establish the syphilitic origin of appendicitis, Gaucher should have brought forward anatomopathologic proofs, which he did not do. Dr. Monod, of the Faculté de médecine de Paris, in supporting the statements of Drs. Jalaguier, Routier and Quénu, stated that he also, in the course of a long experience, had never observed an appendicitis which could in any way be attributed to syphilis.

Death of Dr. Paul Redard

The death is announced of Dr. Redard of Paris, which occurred at Cannes. He was formerly chief of the clinic de la Faculté de médecine de Paris and surgeon in chief of the Furtado-Heine hospital and dispensary. He specialized in orthopedics, on which subject he had published a number of works.

Against Alcoholism

The Union des Françaises contre l'alcohol (Union of French Women against Alcohol) has organized, in the form of a vast series of petitions to parliament and to the public authorities, a great public manifestation against alcoholism which is timed to coincide with the reassembling of parliament. For this purpose there have been distributed to the adherents of the various feminist groups copies of the petition addressed to parliament and to the government. In this petition the union insists on the principle that private interests must give way before those of the country, and, when it is a question of the general lives of millions of beings, one must not stop at half measures. The petition demands the abolition of the privilege of the small distillers, the suppression of spirits for drinking, and the development and encouragement of the use of industrial alcohol.

M. Albert Thomas, undersecretary of state for artillery ammunitions, is beginning serious steps for the vigorous repression of the ravages of alcohol in factories working for the national defense in the neighborhood of which new saloons have been opened. These measures comprise regulation of the consumption, and closing of the saloons and the application to soldiers working in the factories of the same rules as those for their comrades with the colors with the accompanying sanctions. Every workman found drunk will be immediately sent to the front.

Marriages

Capt. Alfred Parker Upshur, M. C., U. S. Army, Camp E. S. Otis, C. Z., to Miss Amelie Augustine McAlister of Washington, D. C., in New York City, June 15.

Katherine Isabel Tate Slattery, M.D., Boston, and Norristown, Pa., to Mr. W. J. Lore Fricka of Philadelphia, at Philadelphia, June 21.

Nathaniel Mills, M.D., Mt. Vernon, N. Y., to Miss Gladys Josephine Capen of Bronxville, N. Y., at Mt. Vernon, June 29.

John Clay Williams, M.D., to Miss Catherine Corum, both of Stroud, Okla., at Kansas City, Mo., recently.

Henry Edward Oesterling, M.D., Wheeling, W. Va., to Miss Mary Thornton Patton of Philadelphia, June 14.

Christian Ulrich Senn, M.D., to Miss Harriet A. Smith, both of Ripon, Wis., at Westfield, Wis., June 17.

John Russell Noyes, M.D., Brockton, Mass., to Miss Frances Hughes of New York City, June 17.

Arminius Cleveland Pole, M.D., to Miss Margaret MacPherson Horn, both of Baltimore, June 22.

Melvin Albert Vogtel, M.D., Winthrop, Minn., to Miss Emily Beatrice Clark of Chicago, recently.

Walter Irenaeus Ryder, M.D., to Bernadette Marie McWeeny, M.D., both of Boston, June 20.

Joseph M. Spellissy, M.D., Philadelphia, to Miss Josephine C. Schwarz of Harrisburg, Pa., June 21.

Ralph Wilbur Hardinger, M.D., to Miss Helen M. Calkins, both of Cincinnati, June 17.

William James Neuzil, M.D., to Miss Alice Dobry, both of Cedar Rapids, Ia., June 14.

Egdar Newton Fought, M.D., to Miss Edith C. Donohue, both of Philadelphia, June 22.

Clara H. Moore, M.D., to Prof. James D. Phillips, both of Madison, Wis., recently.

Justin Allis Garvin, M.D., to Miss Charlotte Meyer, both of Cleveland, June 16.

Washington West, Jr., M.D., to Miss Agnes Mace, both of Belleville, Ill., June 16.

Elmer Irl Dunkelberg, M.D., to Miss Julia E. Miles, both of Waterloo, Ia., June 17.

Kevin David Lynch, M.D., to Miss Florence Sennett, both of Butte, Mont., June 20.

Thomas J. B. Shanley, M.D., to Miss Anna Sennett, both of Butte, Mont., June 20.

Deaths

Thomas A. Ashby, M.D., Baltimore; University of Maryland, Baltimore, 1873; aged 68; a Fellow of the American Medical Association and president of the Medical and Chirurgical Faculty of Maryland in 1890; a fellow of the American Gynecological Society and of the American College of Surgeons; professor of diseases of women in his alma mater; professor of obstetrics and clinical gynecology in the Woman's Medical College, Baltimore; gynecologist to the Maryland General Hospital and consulting gynecologist to the Baltimore Home for Incurables, St. Agnes' Hospital and Mount Hope Asylum, Baltimore; a member of the House of Delegates of Maryland in 1910; who had conferred on him the degree of LL.D. by Washington and Lee University in 1912; author of several books dealing with the Civil War; widely known as a teacher and gynecologist; died at his home, June 26.

Grear Hill Baker, M.D., San Antonio, Tex.; Medical College of Ohio, Cincinnati, 1903; aged 37; a Fellow of the American Medical Association; formerly of Cincinnati, demonstrator of histology and bacteriology in the Cincinnati Dental College, demonstrator in the Children's Clinic and assistant in the chair of materia medica in his alma mater, and a member of the staff of the Cincinnati City Hospital; chief surgeon of the San Antonio Traction Company and Gas and Electric Company; died at his home, June 15.

J. Seward White, M.D., South Glens Falls, N. Y.; Albany N. Y., Medical College, 1880; aged 59; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of New York; a member of the medical staff of Parks Hospital, Glens Falls; for many years village trustee and health officer; for twenty-five years president of the First National Bank of South Glens Falls; died at his home, June 19.

Vincil O. Williams, M.D., Nevada, Mo.; St. Louis University School of Medicine, 1904; aged 36; a Fellow of the American Medical Association; division surgeon of the Missouri Pacific railroad and superintendent of the Vernon Sanitarium, Nevada; chief surgeon on the staff of Brigadier General Harvey C. Clark; was found dead in his motor car near the state national guard camp, Nevada, June 24.

Thomas Francis Cashman, M.D., Washington, Pa.; University of Georgetown, Washington, D. C., 1902; aged 36; a Fellow of the American Medical Association; a member of the medical staff of the Washington Hospital and lecturer on anatomy in its Training School of Nurses; died in the West Penn Hospital, Pittsburgh, June 21.

Albert G. Clopton, M.D., Dallas, Tex.; Tulane University, New Orleans, 1852; aged 89; a veteran of the Mexican War and in the Confederate service during the Civil War; for eight years a member of the faculty of the University of Texas; died at the home of his daughter in Texarkana, June 20, from senile debility.

Henry J. Cook, M.D., Cincinnati; Medical College of Ohio, Cincinnati, 1893; aged 50; a Fellow of the American Medical Association and a member of the Cincinnati Academy of Medicine; a member of the Cincinnati City Council for eight years; died in Bethesda Hospital, Cincinnati, June 17, from galistones.

Joel Henry Rieger, M.D., Kansas City, Mo.; College of Physicians and Surgeons in the City of New York, 1872; aged 66; for many years surgeon of all but one of the railroads centering in Kansas City; died in the German Hospital, Kansas City, June 14.

Harold Herbert Johnson, M.D., Princeton, Ia.; University of Illinois, Chicago, 1905; aged 33; while on his way to his old home in Wilton Junction, Ia., in an automobile, June 25, was struck by a Rock Island train at a grade crossing in Wilton, and instantly killed.

Edward M. Hall, M.D., Delaware, Ohio; Homeopathic Hospital College, Cleveland, 1871; aged 70; a Fellow of the American Medical Association and formerly president of the Delaware County, Ohio, Medical Society; died at his home, June 19.

John Owen Smith, M.D., South Canterbury, Conn.; Eclectic Medical College in the City of New York, 1882; aged 75; for forty-five years a continuous holder of public office, and twice a member of the state legislature; died at his home, June 23.

Oscar J. Gwynn, M.D., Granite City, Ill.; George Washington University, Washington, D. C., 1896; aged 48; a Fellow of the American Medical Association; died in St. Luke's Hospital, St. Louis, June 16, from peritonitis following acute gastritis.

William C. Goodwin, M.D., Odessa, Mo.; Jefferson Medical College, 1853; aged 84; also a druggist; surgeon in the Confederate service throughout the Civil War; for sixty years a practitioner of Missouri; died at his home, June 10.

John H. Alpers, Rantoul, Ill. (license, years of practice, Illinois, 1878); aged 80; for nearly forty years a practitioner of Rantoul; died at the home of his daughter in that place, June 18, from cerebral hemorrhage.

James Lewis Williamson, M.D., Tuscaloosa, Ala.; University of Alabama, Mobile, 1881; a trustee of the State Insane Hospital and the oldest practitioner of Tuscaloosa; died suddenly while making a professional call in that city, June 16.

Delbert C. Ayers, M.D., Toledo, Ohio; Eclectic Medical Institute, Cincinnati, 1889; aged 46; formerly a member of the Ohio State Medical Association; died at Battle Creek, Mich., June 14, from a nervous disorder.

Edward P. Montgomery, M.D., Whitewright, Tex.; University of Louisville, Ky., 1887; aged 55; a member of the State Medical Association of Texas; was accidentally killed while crossing a railroad track, June 10.

Frederick Ainsworth Pillsbury, Cambridge, Mass. (license, Massachusetts, 1896); aged 48; who had never practiced medicine, but was employed as a chemist; died suddenly in his room in Cambridge, June 11.

Russell Brown Smith, M.D., Westerly, R. I.; College of Physicians and Surgeons in the City of New York, 1884; a Fellow of the American Medical Association; aged 59; died at his home, June 4.

Frederick H. Sage, M.D., Middletown, Conn.; New York Homeopathic Medical College, New York City, 1884; aged 55; died in Middlesex Hospital, New York City, June 7, from pneumonia.

Upton E. Traer, M.D., Evanston, Ill.; New York Hygieo-Therapeutic College, New York City, 1873; aged 81; died in the Evanston Hospital, June 12, from the effects of a fracture of the hip.

Charles Macalo Tobyne, M.D., New York City; Eclectic Medical College of the State of New York, 1897; aged 48; died at the New York Post-Graduate Hospital, June 13, from heart disease.

Henry B. Tate, M.D., Pacolet, S. C.; Atlanta, Ga., Medical College, 1887; aged 54; formerly a member of the Medical Association of Georgia; died at his home near Pacolet, May 30.

Charles H. Gilbert, M.D., Rushville, Ind.; Pulte Medical College, Cincinnati, 1879; aged 58; an ophthalmologist and otologist; died at his home, June 13, from heart disease.

Thomas Miller, M.D., Fincastle, Va.; M. R. C. S. England, 1859; Guy's Hospital, London, 1860; aged 79; died at his home near Fincastle, May 29, from cerebral hemorrhage.

Augustus Marable, M.D., Dallas, Tex.; University of Vermont, Burlington, 1895; Long Island College Hospital, 1897; aged 48; died at his home, June 1, from acute gastritis.

Walter B. Pier, M.D., Moscow, Pa.; Jefferson Medical College, 1884; aged 56; also a druggist; died at the home of his wife's mother in Moscow, June 9.

John T. White; Grand View, Ind. (license, Indiana, 1897); for two terms auditor of Spencer County; a veteran of the Civil War; died at his home, June 9.

Andrew Franklin O'Bryan, M.D., Longview, Tex.; Medical College of the State of South Carolina, Charleston, 1860; aged 80; died at his home, June 7.

Robert M. Bailey, M.D., Silverrun, (Jenifer P. O.), Ala.; Atlanta, Ga. Medical College, 1866; aged 76; a Confederate veteran; died at his home, June 7.

William Arthur Hanlin, M.D., Middleport, Ohio; Hahnemann Medical College, Chicago, 1881; aged 66; died at his home, June 5, from diabetes.

Eugene Albert Gilman, M.D., Boston; Harvard Medical School, 1872; formerly of South Boston, Mass.; died in Boston, June 17.

Wallace D. Jefferson, M.D., Petersburg, Va.; Medical College of Virginia, Richmond, 1905; died in Staunton, Va., June 11.

The Propaganda for Reform

In This Department Appear Reports of the Council on Pharmacy and Chemistry and of the Association Laboratory, Together with Other Matter Tending to Aid Intelligent Prescribing and to Oppose Medical Fraud on the Public and on the Profession

WINE OF CARDUI SUIT

(*Continued from page 64*)

May 17, 1916, Afternoon

TESTIMONY OF DR. GEORGE C. AMERSON (*continued*)

Dr. Amerson resumed the stand for the plaintiff in rebuttal.

FURTHER CROSS-EXAMINATION BY MR. T. J. SCOFIELD

Q.—Doctor, what is synergism? *A.*—What is it?

Q.—What is synergism? *A.*—Well, it is that term applied to the action of drugs whereby their activity or potency is increased by being in combination with another drug of similar action.

Q.—Do you know anything personally about the synergistic action of drugs? *A.*—No, sir.

Q.—You never had any experience in testing such action? *A.*—No, sir.

Q.—Well, is there such a thing as synergistic action, or do you know? *A.*—As far as I know, there is.

Q.—I am not asking so far as you know. I am asking whether there is or is not? *A.*—From my personal experience and experiments, no.

Q.—Doctor, I suppose you are familiar with what is ordinarily called flooding by the laymen, are you not, in women? *A.*—Yes, sir.

MENORRHAGIA AND METRORRHAGIA

Q.—That is what you call menorrhagia, is it? *A.*—Yes, sir.

Q.—Or metrorrhagia? *A.*—Yes, sir.

Q.—What is the difference between menorrhagia and metrorrhagia? *A.*—One is flooding between the regular periods, that is menorrhagia, and metrorrhagia would be excessive flooding at the regular period.

Q.—How is that, doctor? State that again. I did not get your answer. *A.*—Menorrhagia is flooding between the periods, or flooding between the periods, excessive flooding, and metrorrhagia is excessive flowing at the normal period.

Q.—That is your understanding of the definition of the two terms, is it? *A.*—Yes, sir.

Q.—You feel quite sure that you are right as to that definition, or those definitions? *A.*—These terms are very often used together. I believe I am right; yes, sir.

Q.—Well now, is it not a fact, that you are not right, and that you have just got that reversed?

An objection was made by Mr. Walker, attorney for the plaintiff, but withdrawn.

Q.—You still adhere to that answer, do you? *A.*—Yes, sir.

Q.—Now, I ask you again, don't you know that that is not the proper definition of either one? *A.*—I could not say that, when I just said that I believe it is.

The witness then stated that menorrhagia and metrorrhagia might have a common cause. He does not believe that—as stated in the Ladies Birthday Almanac for 1907—"Flooding is always a sign of danger. The best treatment is complete rest in bed and Wine of Cardui three times a day." The witness stated the various causes which produce flooding in which this treatment would not be proper treatment.

He stated that where there was simply an engorgement of the uterus and tubes and adnexa, that treatment would be all right. He stated that the medicine in Wine of Cardui might be indicated and be a good treatment and would not do any damage in a case of acute salpingitis without suppuration, recognizing the fact that it contains 48 drops of alcohol. He considers the alcohol negligible absolutely in the doses and frequency given in Wine of Cardui. He considers the alcohol negligible because it is oxidized in the stomach. He does not know how much is oxidized in the stomach but he believes that some of it is. He does not know that none of it is oxidized in the stomach. He stated that the rest of it is oxidized in the blood stream and intestinal tract. He thinks it could be broken up anywhere. He does not know what it is broken up into.

Q.—I understand you to say that it loses its toxic effect by reason of being oxidized? *A.*—No.

Q.—Is that right? *A.*—No, sir.

Q.—What was it you said about that? *A.*—I said that alcohol in the quantity given would not be toxic.

Q.—Why? *A.*—Because in the dilution and percentage of it, I would consider it possibly to have—to be a food, possibly a tonic, and if given in stronger doses, or larger quantities it would be a stimulant. When you get beyond the stimulant stage, you get the toxic action.

Q.—Then it does not lose its effect, whatever that may be, by reason of oxidization? *A.*—Certainly it does.

Q.—How does it produce intoxication then, doctor? *A.*—Because, of its rapid absorption in enormous quantities.

Q.—Well, need the quantities be enormous in order to produce intoxication? Does not that depend on the person? *A.*—It varies with the individual; yes, sir.

Q.—So that, notwithstanding the fact that you say it is oxidized, it will nevertheless produce its effect, don't it? *A.*—I do not understand you.

Q.—That is, its intoxicating effect, doesn't it? *A.*—If taken in sufficient quantities, yes.

Q.—When does it produce that intoxicating effect, before it is oxidized or after? After it is oxidized or before? *A.*—I don't know; I suppose it would be before.

Q.—So that the toxic effect precedes oxidation, does it? *A.*—Yes, I should imagine so.

Q.—How rapidly is alcohol oxidized? *A.*—I do not know; it varies with the—

Q.—How much of the alcohol—

Mr. Walker:—Wait a moment. He has not finished his answer.

A.—I said I do not know. It will probably vary with the amount of it that was taken, and the contents of the stomach probably would influence it.

The witness has never tested for alcohol in urine. He stated that almost any intoxicant, if taken in sufficient quantity to produce a toxic effect, would be found in all the secretions, and if it was oxidized and broken up and separated, it could not be identified. He stated that if the alcohol is found in the urine, it is not oxidized. He does not know how much alcohol is oxidized in the system but he imagines that it varies with the individual and with the amount of tolerance of the alcohol. He does not know how much of 48 drops of alcohol contained in the Wine of Cardui is oxidized but he imagines that it all is. He does not, however, know. He stated that alcohol is a habit forming drug but he does not know what percentage of alcohol is necessary in a solution to be habit forming. He believes that it would vary in different individuals.

Q.—Is it not true that the tendency of the formation of the habit depends more particularly upon the effect of the amount of alcohol that is taken, on the person, rather than on the percentage? *A.*—I do not know as to that. I could see how it would be both ways.

Dr. Amerson stated that the medicine similar to Wine of Cardui is a proper medicine, provided the symptoms call for a medicinal agent that was in the solution. It would not be a proper medicine when there were no symptoms and therefore it is not good in all cases.

The witness stated that puberty is an entirely physiologic and natural process, and that in a great percentage of cases, no medicine is indicated.

The witness stated concerning a statement in the Home Treatment for Women for 1912, to the effect that "every girl should take Cardui at the time of puberty. It could not do her anything but good," that he did not believe every girl should take it without symptoms.

Dr. Amerson stated that he does not agree that such a combination is indicated for and should be used by all married women regardless of their physical condition. The witness stated concerning the statement from the Home Treatment Book for Women for 1913 "all newly married women should take Cardui," that he does not agree with it. The witness stated that unless there was some indication for its use, such a medicine should not be used by all pregnant women.

Q.—Do you believe, doctor, in the statement contained in Home Treatment, that that medicine so taken could never do a pregnant woman anything but good? *A.*—Yes, I do agree with that.

Mr. T. J. Scofield: *Q.*—Do you believe in that? *A.*—Yes.

Q.—That this alcoholic medicine could never do a pregnant woman, anything but good? *A.*—Yes, I do.

Q.—Suppose that she had Bright's disease, doctor, then do you think it would do her good? *A.*—The good that might be accomplished by the medicine would probably be overcome by the very slight possibly irritating effect that you are trying to assume that the alcohol would have.

Q.—You say it might be? *A.*—Yes, yes I believe it would be.

Q.—Then you think that a woman who is pregnant, and suffering with Bright's disease, and had albumin in her urine, might with perfect safety and with good results take this medicine three or four

times a day, throughout the period of pregnancy, do you believe that? *A.*—Yes, if she had the Bright's disease as bad as you are asking of me, she probably would not continue her pregnancy.

Q.—What? *A.*—If she had her Bright's disease, as acute and as active as you are indicating to me, she probably would not continue her pregnancy.

Q.—She would have eclampsia, wouldn't she? *A.*—She might have.

Q.—Would you be willing, or do you subscribe to the doctrine that a woman in that condition, should continue to take such a medicine as that in that condition throughout the time that she would carry her child? *A.*—I don't believe the alcohol would have any influence on it at all.

Q.—You don't? *A.*—No, sir.

Q.—And you state that upon your reputation as a physician and surgeon? *A.*—Yes, sir.

MEDICINE IN PREGNANCY

Q.—Do you believe that such a medicine as Mr. Walker has described, and which contains 48 drops of pure alcohol, taken as it is recommended, three or four times a day in tablespoonful doses, should be used by all women during the lying-in period? *A.*—Well, it would be a help to practically all of them.

Q.—Do you believe that it should be taken by all women during the lying-in period? *A.*—Well, "all women" is a pretty general term.

Q.—I understand it is, but that is the language of the book. *A.*—The great majority of them, probably it would do a lot of good to practically all of them, I should say.

Q.—Do you agree with that statement that it should be taken by all women during the lying-in period? *A.*—No, because I believe some of them do not need anything.

Q.—Then you don't agree with that statement, do you? *A.*—Not—

Q.—How is that? *A.*—Well, my answer suggests that I don't agree with it entirely, not in its entirety. I can see conditions where—

Q.—Do you believe, doctor, that such a medicine as we have been talking about should be used by all women during all the years of the menopause? *A.*—Not unless she has some symptoms that would suggest its use.

Q.—If she does not have symptoms that would suggest its use, then that statement is not true, is it? *A.*—There would be no indication for medication then.

Q.—Then that statement is not true, is it, that all women should take it all through the period of the menopause? *A.*—Well, of course, that includes them all again, the same question over again.

Q.—You don't approve of it? *A.*—I don't believe that all women would find it necessary to take it; no sir.

The witness stated that he has found albuminuria by examination of the urine, a great many times in pregnancy. He treats such cases by putting the patient on a bland treatment of milk, etc. If the medicine was indicated, the witness stated that it would be proper treatment to give an alcoholic solution. He would not let the fact that there was alcohol in the medicine make any difference.

Q.—Would you try to avoid a medicine under such circumstances that contained 48 drops of pure alcohol, which was given in dosages, running in from three to four doses, tablespoonful doses, a day? *A.*—It would depend upon what I thought of the kidney complication.

Q.—Suppose, doctor, that she was drinking two thirds of a bottle of beer every day, would you want her to continue that, or would you want her to cut it off? *A.*—The chances are I would have her stop it for the time being, in order to see what influence it had. If she was in the habit of drinking beer right along—

Q.—Why would you have her stop it? *A.*—Well, just for purposes of observation, I suppose.

Q.—That would be all? *A.*—Yes.

Q.—If she had been drinking it right along, would you think that had anything to do with the condition of albuminuria? *A.*—No, I probably would not.

Q.—Then why would you want to stop taking it? *A.*—Just as I say, to satisfy myself. We meet lots of foreigners who drink wines and beer repeatedly and in large quantities, and if albuminuria came up in a case of that kind, why I would not feel justified in blaming it on the small amount of alcohol she had been in the habit of taking daily for years, probably.

The witness stated cancer is a relatively common condition at the menopause. He did not think he could cure a beginning cancer of the cervix at the menopause, by using Wine of Cardui. He did believe that at early stages of this disease, a radical operation might prevent the progress of the disease, and stated that he has eradicated some.

Q.—Now, doctor, take one of these cases, such as you have had a cure of, or eradicated in the early stages of the trouble, suppose the woman had been taking such a medicine as Wine of Cardui for several months along in the dosage prescribed. What then do you think would have been her chances of being cured, when you discovered finally that she had cancer, after it had involved the lymphatic glands? *A.*—Well, ordinarily, carcinoma of the cervix and uterus is not recognized until it had extended quite far, even by the surgeon and the medical men.

Q.—Well, those are the cases then, that you cured, are they? *A.*—No, sir.

Q.—Then you did recognize them before, did you? *A.*—What do you mean?

Q.—You say you cured cases of cancer of that kind? *A.*—Certainly, I have cured cases of cancer.

Q.—You recognized it early, didn't you? *A.*—Yes, sir.

Q.—Well now, I say, suppose that instead— *A.*—By means of the pathologist, who identified it.

WINE OF CARDUI IN CANCER

Q.—I don't care what the means were. Suppose that instead of coming to you for examination, and the examination being made as you made it, and the discovery being made as you made it, this woman had been taking Wine of Cardui, along for months and months and months, for a year until that involved the lymphatic glands, could you have done anything for her when she came? *A.*—That would be all problematical, I could not tell.

Q.—What is your judgment and opinion about it? *A.*—I don't believe Wine of Cardui would influence it either way.

Q.—You don't think it would influence it one way or the other? *A.*—No.

Mr. T. J. Scofield: *Q.*—In the meantime, I suppose, while she is taking it, the disease would be progressing, would it not? *A.*—That is the history of cancer, yes, sir. That it progresses.

The witness stated that he agrees with the following statement from the Home Treatment Book for Women for 1912. "Cardui acts on the cause of the disease, and is, therefore, not a mere palliative, but a scientific and specific remedy, with a curative effect on the seat of the trouble."

The witness stated that he has an office in the same suite with Dr. Funck, that they have a common reception room and that he has talked the case over with Dr. Funck several times.

REDIRECT EXAMINATION BY MR. WALKER

Dr. Amerson stated that there are six or seven other doctors and a couple of dentists in the same suite. The witness stated that in those cases of menorrhagia and metrorrhagia in which he stated that this medicine would not cure, the disease was surgical, and that in such cases this medicine would be valuable as a tonic. The witness stated that he does not believe Wine of Cardui would mask the symptoms of a cancer.

Dr. Amerson stated that within his knowledge of the medical profession, after a diagnosis is made they are often at fault. The witness stated that he believes that this medicine was a scientific and specific medicine with a curative effect. There is no specific for the cure or treatment of gonorrhea. Anything that would have a tendency to improve the general health, thereby increasing the local resistance and vitality, would be a scientific medicine with a curative effect.

RECROSS-EXAMINATION BY MR. T. J. SCOFIELD

Q.—That is the way you cure gonorrhea, is it?

Mr. Walker:—That is objected to.

THE COURT:—He may answer.

To which ruling of the Court the plaintiff, etc., excepted.

A.—Sir?

Mr. T. J. Scofield: *Q.*—That is the way you cure gonorrhea? *A.*—That is the way gonorrhea is treated, and that is the way a cure is accomplished.

Q.—That is the way you cure it, is it? *A.*—How do you mean, just the internal—

Q.—Just as you have told Mr. Walker. *A.*—I told you my theory as to how it is cured, and I told you this morning, how I treated it.

Q.—That is the way you do it? *A.*—I treat it locally and generally and my general treatment is given for the purposes of accomplishing just what I have stated now.

Q.—Isn't it true that sometimes when you think you have gotten a case of gonorrhea cured that you give them a dose of alcohol for the purpose of seeing whether it livens up the condition, and whether in fact it is cured or not? *A.*—Some authorities say that gonorrhea is incurable.

Q.—Well, isn't that true, don't you give them alcohol after you think you have cured them, for the purpose of seeing whether or not they are cured? *A.*—I never have.

Q.—That profession generally does that, or do you know? *A.*—I don't believe they do.

Q.—Do you know whether they do or not? *A.*—Deliberately give alcohol?

Q.—Yes, for the purpose of seeing whether or not the condition of gonorrhea has been cured? *A.*—I don't believe they do; I don't do it myself.

Mr. Walker:—If you did give it, you would not give it in a dose that would be negligible, would you? *A.*—No, sir.

TESTIMONY OF DR. HENRY H. RUSBY

Dr. Henry H. Rusby was called as a witness on behalf of the plaintiff in rebuttal, and, having been first duly sworn, testified as follows:

DIRECT EXAMINATION BY MR. HOUGH

Q.—State your name? *A.*—Henry H. Rusby.

Q.—Where do you live? *A.*—Newark, New Jersey.

Q.—What is your age? *A.*—Sixty-one.

Q.—What is your business or profession? *A.*—I am professor of materia medica in the College of Pharmacy of Columbia University.

Q.—When did you graduate? *A.*—1884.

Q.—Where? *A.*—New York University.

Q.—What did you graduate as? *A.*—M.D.

Q.—Now, what are you doing? *A.*—I am teaching materia medica.

Q.—Where? *A.*—At the College of Pharmacy of Columbia University, in New York.

Q.—Do you occupy any other position? *A.*—Yes, I am pharmacognosist for the Department of Agriculture of the United States government, examining drugs that come to the port of New York to see whether they are up to standard.

Q.—How long have you held that position? *A.*—Ever since the Food and Drug Law went into effect, 1907.

Q.—What is a pharmacognosist, doctor? *A.*—It is a men whose profession is to identify and select drugs.

Q.—What honorary positions have you held? *A.*—I have been a member of the revision committee of the United States Pharmacopeia since 1890. I also taught materia medica in Bellevue Medical College for seven years.

THE COURT:—New York City?

A.—Yes, sir.

Mr. Hough:—Are there any other positions you hold? *A.*—Not in a medical line.

Q.—Are you connected with the New York Botanical Gardens? *A.*—Yes, sir; I am chairman of the scientific directorate of the New York Botanical Gardens.

Q.—Are you a curator also? *A.*—Of the Economic Museum.

Q.—Are you member of any other revision committee than the revision committee of the United States Pharmacopeia? *A.*—The National Formulary.

Q.—Are you a member of any other committee? *A.*—Nothing in this line. I am a member of a good many committees and societies.

Q.—Are you connected with the National Pharmaceutical— *A.*—Oh, yes; that is another thing. That book has already been published.

Q.—You are a member of that committee? *A.*—Oh, yes.

Q.—Well, are you not a member of the New York Board of Health, the advisory committee? *A.*—Yes, sir.

Q.—Are you a member of any other scientific organization? *A.*—The American Pharmaceutical Association, and some foreign societies.

Q.—Sir? *A.*—And some foreign societies.

Q.—Are there any others? *A.*—Botanical societies, and the Academy of Sciences of New York.

Q.—Are you the author of any books? *A.*—Yes, sir; I am one of the authors of the National Standard Dispensatory. I am the author of the materia medica articles in Buck's Handbook of the Medical Sciences, and several books on botany.

Q.—Botany of what? *A.*—Just structural botany, textbooks.

Q.—What positions have you held, doctor? *A.*—Why, those that I have just stated; I might mention this; I was for some years botanist for Parke, Davis & Company.

Q.—Who are they? *A.*—A large drug house of Detroit.

Q.—Were you ever connected with any hospitals or asylums? *A.*—Yes, sir; I was clinical clerk to the medical staff of the Woman's Lunatic Asylum, on Blackwell's Island for a year.

Q.—For what length of time? *A.*—One year.

Q.—Have you ever engaged in any exploratory work? *A.*—Yes, I have been physician to two exploring expeditions.

Q.—What were they? *A.*—One was on the Orinoco River, an exploring company gotten up in Minnesota, and the other was a journey across South America.

Q.—What part of the world have you been in in studying drugs? *A.*—Pretty nearly the whole of the North and South American continents. I have studied a good deal in England also, in the drug markets.

Q.—Does that examination of drugs in New York that come into this country, is that under the Treasury Department, or the Department of Agriculture? *A.*—Department of Agriculture, Bureau of Chemistry.

Q.—Have you ever practiced your profession any, doctor? *A.*—Well, I practiced—I was clinical clerk on the medical staff of the asylum in New York for a year, and I practiced as physician to these exploring expeditions, but I have never had any general family practice.

Q.—What are your duties, doctor, as professor in the College of Pharmacy? *A.*—I lecture on materia medica and toxicology and also on physiology.

Q.—Do you lecture on drugs? *A.*—Yes.

Q.—And actions? *A.*—Their actions.

Q.—And their properties? *A.*—Not on the drugs themselves. I used to do that, but I had too much to do, and I turned it over to the associate professor. I simply lecture now on their uses, and effects on the system, poisonous effects.

Q.—Well I say, that is of drugs? *A.*—Yes, sir.

Q.—Doctor, do you know a drug called viburnum prunifolium? *A.*—I do.

Q.—Have you any opinion as to its therapeutic value? *A.*—I have.

Q.—What is your opinion as to its therapeutic value? *A.*—It is one of the most valuable drugs in the pharmacopeia.

Q.—For what conditions? *A.*—For spasmodic conditions of the abdominal organs.

Q.—What do they include? *A.*—The intestines and uterus.

Q.—Doctor, do you know a drug known as carduus benedictus? *A.*—I do.

Q.—Or cnicus benedictus, or blessed thistle? *A.*—I do.

Q.—They are all one and the same, are they? *A.*—Yes, sir.

Q.—Have you any opinion as to its therapeutic value? *A.*—I have.

Q.—What is your opinion as to its therapeutic value? *A.*—It is a useful medicine.

Q.—For what conditions? *A.*—It is a diuretic, it is a stimulant of intestinal action; it is a tonic and appetizer; generally beneficial to nutrition, and it is a stimulant to unstriped muscular fiber.

Q.—Would you regard it as a uterine tonic or medicine? *A.*—It is.

Q.—Doctor, would there be any advantage in combining those two medicines in a liquid form, we will say to the extent of 60 grains to the fluidounce of viburnum prunifolium, and six grains to the fluidounce of carduus benedictus—no, just the reverse, carduus benedictus, 60 grains, and six grains of viburnum prunifolium? *A.*—There might be in some cases. I think there would be generally.

Q.—Have you any opinion as to the value of that medicine in that combination, in a fluidextract of 20 per cent. alcohol? *A.*—It would be a useful medicine.

Q.—For what conditions? *A.*—For the conditions that I have just stated, especially in regulating the blood pressure, what we call a vaso-motor regulator.

Q.—Doctor, is there any danger in giving that medicine, which we will say contains 48 drops of alcohol to the dose, in that diluted form, the dose being a tablespoonful three or four times a day, to a girl or a woman suffering with some female trouble? *A.*—Well, I would not—

Q.—I mean, on account of the alcohol that is in it? *A.*—No, sir, there would be none.

Q.—Would there be any danger of creating a habit because of that amount of alcohol in it? *A.*—None.

Q.—Why not, doctor? *A.*—Because that is the basis of all the pharmacopeial medicines. It is the basis of the materia medica, that is, the alcoholic preparations contain about that amount of alcohol or some more. I think none of them contain less than that.

Q.—Would that amount of alcohol have any—given to a girl per dose—have any effect in stimulating or arousing her passions? *A.*—No, sir.

Q.—Doctor, how would a medicine of that character act in a case of uterine prolapse, which did not require a surgical operation? *A.*—Its general tendency would be beneficial.

Q.—How would it bring about that result? *A.*—Why, by increasing the nutrition of the muscles, and toning the muscles up, so that they would support the uterus better.

Q.—Doctor, can a medicine be both a tonic and a sedative? *A.*—It can.

Q.—Is this particular medicine both a tonic and a sedative? *A.*—The combination, or one alone?

Q.—The combination? *A.*—The combination would be both tonic and sedative.

Q.—Doctor, have you ever written about carduus benedictus prior to being told of this case? *A.*—Yes, sir.

Q.—Were your opinions the same as you have expressed here? *A.*—Yes, sir.

Q.—Doctor, in your capacity as examiner of the purity of drugs that come into the United States through the port of New York, have you ever had occasion to observe whether any carduus benedictus comes in? *A.*—Large quantities of it, yes, sir.

Q.—Large quantities? *A.*—Yes, sir.

Q.—Have you had occasion to observe where it goes in the United States? *A.*—Yes, it goes into the general trade.

Q.—What do you mean by "the general trade?" *A.*—Why, the large drug houses get it and keep it in stock for sale.

Q.—Doctor, what is the significance of a drug being named or appearing in the different pharmacopeias of the world? *A.*—Why, it is an indication that they are believed to have therapeutical value, and that they are in general use. I would like to change that and say, in common use. The use need not be general, that is, it need not be everywhere, but it must be commonly used.

Mr. Hough:—Take the witness.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

Q.—Doctor, you have not practiced medicine, have you? *A.*—Yes, I have.

Q.—How much? *A.*—I stated that.

EXPERIENCE OF THE WITNESS

Q.—Well, state it again. *A.*—I practiced medicine, I think, for about two years and a half.

Q.—Where? *A.*—In the New York City Lunatic Asylum for Women.

Q.—Where else? *A.*—And on two exploring expeditions in South America.

Q.—How many people were on the exploring expeditions? *A.*—On one I think we had about 30. Well, we had more than 30, but there was 30 in the regular party, and in the other I practiced medicine on the establishments which I visited, the plantations.

Q.—How many women did you have in the expedition of 30? *A.*—Did not have any.

Q.—How many women did you treat on those expeditions, or either of them? *A.*—Why, I think two or three hundred.

Mr. Hough:—I do not think the witness understood the question.

Mr. T. J. Scofield: *Q.*—I say, how many women did you treat on those expeditions that you spoke of, the two expeditions? *A.*—I should think about 200 or 300.

Q.—Women? *A.*—Yes.

Q.—Who were they? *A.*—People of the establishments that I visited, the rubber stations, and the haciendas of those plantations.

Q.—Did you carry medicines with you? *A.*—A very large stock, yes, sir.

Q.—Did you treat any women for uterine troubles? *A.*—No, sir, they do not treat them for that down there. They only allow women to treat women down there. Men are not allowed to treat women for diseases of women in South America.

Q.—Did you ever treat any woman for uterine prolapsus? *A.*—No, sir.

Q.—Did you ever treat any uterine troubles at all? *A.*—Oh, yes.

Q.—How often? *A.*—Well, I could not tell you that.

Q.—Where was that, in the lunatic asylum? *A.*—Yes, sir, we had an enormous quantity of it there.

Q.—Did you give them your personal attention? *A.*—I was clinical clerk and I had to record everything that was done.

Q.—I am asking you whether you treated them, or whether you were simply the agency for making the records? *A.*—I was the agency for making the records.

Q.—So that is as near the treatment as you have been? *A.*—Yes, sir.

Q.—Now, then, you say that viburnum prunifolium will act on what? *A.*—I say it will act on any spasmodic condition of the intestinal organs.

Q.—Did you say that it would act on the muscles? *A.*—Yes, sir.

Q.—What muscles would it act on? *A.*—Muscles of the intestines, the uterus, muscles of the blood vessels and of the stomach.

Q.—What muscles would it act on to cure uterine prolapsus? *A.*—It would act on the muscles of the ligaments.

Q.—What ligaments? *A.*—The ligaments that support the uterus.

MUSCLE FIBERS IN THE LIGAMENTS

Q.—In what way would it act on those muscles? *A.*—By increasing the strength and vigor and nutrition of the muscular fibers.

Q.—How many of those ligaments, if any, contain muscular fiber? *A.*—They all contain some.

Q.—To what extent do they contain it? *A.*—How, is that?

Q.—To what extent is there muscular fiber in the ligaments of the uterus? *A.*—The extent differs at different times.

Q.—Tell us about it? *A.*—During pregnancy there is a great increase in them.

Q.—In the number? *A.*—In the number and in the size.

Q.—Of what? *A.*—Of the muscular fibers.

Q.—What kind of muscular fiber is it? *A.*—Unstriped.

Q.—In the ligaments? *A.*—Yes, sir, and in the uterus.

Q.—What ligaments are you talking about? *A.*—I am talking about the broad ligaments chiefly.

Q.—What say? *A.*—I am talking about the broad ligament chiefly.

Q.—Which other ones? *A.*—Well, that is the principal ligament that gives support.

Q.—What are the names of the other ligaments? *A.*—Well, I do not know that I can give you the names of all of those ligaments.

Q.—The only ligament that you can give us the name of is the broad ligament? *A.*—That is all I can think of at the moment.

Q.—You say that is unstriped muscle? *A.*—I say it contains unstriped muscle.

Q.—Don't you know that it is not unstriped muscle? *A.*—No, I do not.

Q.—Don't you know there are no muscles in it? *A.*—No, sir, I know there are.

Q.—Did you ever make a dissection of this broad ligament? *A.*—I have.

Q.—How often? *A.*—When I was a student in the laboratory.

Q.—How many years ago was that? *A.*—That was in 1883.

Q.—You have never followed it up with a subsequent dissection? *A.*—No, sir.

Q.—You go on record here as saying that the muscles of the broad ligament are unstriped? *A.*—I do.

Q.—You are the author of a book, are you not? *A.*—Not on muscles.

Q.—Are you the author of the National Standard Dispensatory? *A.*—I am one of the authors of that.

Q.—Hare, Caspari and Rusby? *A.*—Yes, sir.

ACTION OF VIBURNUM

Q.—Now, Doctor, what are the actions and uses of viburnum prunifolium? *A.*—It is an antispasmodic; it is a sedative. It also acts as a bitter tonic to some extent. It is largely used in warding off threatened miscarriage or abortion.

Q.—The action of viburnum prunifolium, doctor, is a very feeble action, isn't it? *A.*—It is not.

Q.—It is not? *A.*—No, sir, it is a very marked action.

Q.—What say? *A.*—It is a very marked action.

Q.—Then you do not agree with this statement in your book, contained on page 1714: "The virtues attributed to viburnum prunifolium, are as feeble as they are numerous." You don't agree with that, do you? *A.*—No, sir.

Q.—So that when you said that in your book, which you issued in 1908, you said a thing that was not true? *A.*—I did not say it.

Q.—What? *A.*—You have not drawn out yet that I said it.

Q.—Your name is on this book, and you say that you are one of the men— *A.*—Yes, but it don't say that I wrote the whole book, sir.

Q.—It don't matter whether you wrote the whole book or not. *A.*—It matters a great deal to me.

Q.—You don't agree with that? *A.*—I don't agree with that, and I did not write that.

Q.—You don't stand responsible for that book? *A.*—I do for my part of it.

Q.—Do you stand responsible for this book, that has your name on the back of it? *A.*—I stand responsible for the part of it which I wrote, and now since you have asked the question, I claim the right—

THE COURT:—Does the title page show the portion of the work that was written by the witness?

Mr. T. J. Scofield:—No, it does not.

The Witness:—The preface shows it, your Honor.

THE COURT:—I mean, does the book show it? If it does, let's have it.

Mr. T. J. Scofield:—I don't think it does, your Honor, not so far as I know, at least.

Mr. Hough:—I guess the witness knows.

Mr. T. J. Scofield:—He is one of the editors, at least.

The Witness:—No, sir, I am not one of the editors, sir, I am one of the writers.

Q.—Well, one of the authors, or whatever you please. *A.*—I wrote a certain part of it, but it had no reference to the actions or uses of drugs at all. That was done by Dr. Hare.

THE COURT: *Q.*—Is it stated in the book anywhere, the part of the book that you wrote, and the part that your associates wrote? *A.*—Yes, sir.

Q.—Do you recall just where the statement was made? *A.*—It is in the preface, I do not know just what page.

THE COURT:—That is not necessary.

The Witness:—I can state it myself very clearly.

Mr. T. J. Scofield:—Well, state it for yourself. *A.*—I wrote everything relating to the drugs themselves, their botanical names, their titles and their descriptions, their adulterants, their constituents; but at that point I stopped it, and Dr. Hare took it up, and wrote the articles on their uses.

Q.—Then you only feel qualified to testify as to those things?

A.—As far as that book is concerned.

Mr. Hough:—I object to that.

Mr. T. J. Scofield: *Q.*—Then, doctor, I will ask you this: Do you agree with this statement—

The plaintiffs here objected but later withdrew the objection.

Mr. T. J. Scofield:—(Reading.) "It is an ingredient of many proprietary preparations vaunted as uterine sedatives, but the experience of most physicians fails to justify a belief in the qualities claimed for it." Do you agree with that?

THE COURT:—No, no, did you write it?

A.—I had nothing to do with it, and I do not agree with it.

Mr. Hough:—What edition is that you have there?

Mr. T. J. Scofield:—I am reading from the 1909.

Q.—Doctor, did you write that part of this book—

Mr. Hough:—What page?

Mr. T. J. Scofield:—that relates to carduus benedictus?

A.—The part which related to its description, I did. The part that relates to its action and uses, I did not.

Q.—You did not say anything about its actions and uses, or the book does not, does it? *A.*—Not in that book, no, sir. I did not say anything about it.

Q.—There is nothing said in that book about its action and uses, is there? *A.*—That I cannot tell you.

Q.—Excepting that it is a bitter tonic? *A.*—That is something I cannot tell you. If Dr. Hare wrote it, I do not know it; I paid no attention to that part of the book, sir. I had nothing to do with it.

Q.—Doctor, what is it that you say has a tonic effect on unstriped muscles? *A.*—I said blessed thistle did.

Q.—Well, that is carduus benedictus, isn't it? *A.*—Yes, sir.

Q.—On what do you base that statement? *A.*—On the reputation of the drug in the literature. I have not used it myself for that purpose.

Q.—Will you tell us the name of an author or an article that was ever written by any person of any standing, or anybody at all, who has said that carduus benedictus has an effect on unstriped muscle? *A.*—In those words?

Q.—Yes? *A.*—No, sir.

Q.—Or words in substance that? *A.*—Yes, sir.

Q.—Who? *A.*—Hale and King's Dispensatory. I have given the action of it, and the action which they give must have worked in that way; that is the only way it could work in.

Q.—That is a deduction, doctor? *A.*—That is a deduction.

Q.—I am wanting to know what they said. *A.*—I cannot give you the wording, the precise wording, but what they have said about it involves that effect.

ALCOHOL CONTENT

Q.—Doctor, what was it you said about the alcohol content in medicines generally speaking? *A.*—I said there are none of the alcoholic preparations of the pharmacopeias that contain less alcohol than this preparation you have spoken of; 20 per cent. is the smallest amount.

Q.—You mean per cent., don't you, doctor? *A.*—I do.

Q.—How about the question of dosage? *A.*—Well, the dosage is different with different things.

Q.—Well, I am asking you about the dosage? *A.*—Well, what do you ask me?

Q.—I want to know what the percentage of alcohol in the dosage of these different pharmacopeial preparations that you speak of, or pharmaceutical preparations is, as compared with the dose of Wine of Cardui? *A.*—I do not know anything about—nobody has asked me anything about Wine of Cardui yet.

Q.—This preparation that is involved in this suit is supposed to contain 48 drops of alcohol to every dose. *A.*—That is about the dose of the tinctures of the pharmacopeia.

Q.—In the doses that they are used by physicians? *A.*—Yes, sir.

Q.—How about aconite? *A.*—That is not one of them.

Q.—How much is there in a dose of the tincture of aconite, how much alcohol? *A.*—Will you ask that question again, I did not catch the question.

Q.—I say, how much alcohol is there in a dose of the tincture of aconite? *A.*—Very little in a dose, inappreciable.

Q.—How much alcohol is there in a dose of the tincture of nux vomica? *A.*—Nearly, as I remember, about 27 drops.

Q.—Why don't you know that the dose is only five drops, doctor, the whole dose? *A.*—You are talking, I think, of the fluidextract.

Q.—I am talking of the tincture. *A.*—Well; I don't remember the percentage of alcohol in the tincture of nux vomica.

Q.—Don't you know that the dose is from 5 to 10 drops? *A.*—I want to call attention to the fact that you are asking me about something I did not say. I said, drugs of this class. Now those drugs are poisonous drugs, which are given in very small doses.

Q.—You mentioned tinctures, didn't you? *A.*—When I answered this question, I said drugs of this class.

Q.—Well, what drug do you refer to now? *A.*—I should say tincture of columbo, and compound tincture of cinchona, drugs used for their bitter tonic properties.

Q.—Are the two drugs that you have just mentioned in the same class as viburnum prunifolium and carduus benedictus? *A.*—In the same class as carduus benedictus, yes.

Q.—How about viburnum prunifolium? *A.*—They are not in the same class.

Q.—Mention some that are in the same class with viburnum prunifolium, where the alcohol content is as large? *A.*—I do not think there is any other drug that is quite like viburnum prunifolium, except viburnum opulus. Valerian is something like that.

DOSAGE OF TINCTURES

Q.—What is the dose of tincture of valerian? *A.*—The ordinary dose is a teaspoonful.

Q.—How much alcohol is there in it? *A.*—I think there is 75 per cent.

Q.—Don't you know, doctor, that the dose of that preparation is 15 drops? *A.*—It is given sometimes in 15 drops.

Q.—Don't you know that that is the average dose? *A.*—No, sir.

Q.—Do you say that it is given in teaspoonful doses? *A.*—You have got an ammoniated tincture, and you have got the tincture; the ammoniated tincture is given in 15 drops, and the other 30.

Q.—I am asking about the tincture. *A.*—They are both tinctures.

Q.—Both of them? *A.*—Yes, sir.

Q.—Is the dosage the same? *A.*—No, sir, one is twice as great as the other.

Q.—I am speaking of the simple tincture? *A.*—The ordinary dose of it, which is given, is sixty minims, one teaspoonful.

Q.—Do you know how much alcohol there is in that? *A.*—I say, I think 75 per cent.

Q.—Do you know how much? *A.*—About 75 per cent.

Q.—About 75 per cent.? *A.*—Yes, sir, which would give us about 45 drops.

Q.—Doctor, can you imagine, or can you name a single tincture where the dose contains as much as 48 drops of alcohol? *A.*—Oh, yes.

Q.—What one? *A.*—That is one that I have just given you.

Q.—Which one is that? *A.*—That is the tincture of valerian, and tincture of columbo, which is given very often in teaspoonful doses.

Q.—What is the alcoholic content? *A.*—Sixty per cent.

Q.—That would be 20 drops, wouldn't it? *A.*—No, it would be 36 drops.

Q.—Can you mention one that contains 48 drops to the dose? *A.*—I don't think there is any that has exactly 48. I think that the tincture of cinchona contains more than 48 drops to the dose.

Q.—How is that? *A.*—I think the tincture of cinchona contains more than 48 drops to the dose. I think it is 90 per cent. of alcohol in that, a teaspoonful at a dose.

Q.—You don't profess to be certain about that, doctor? *A.*—Well, it is pretty hard to remember all the strengths given in the pharmacopeia, off hand, but I am pretty sure of it.

Q.—Now you say that carduus benedictus is imported into this country pretty largely? *A.*—Yes, sir.

Q.—When you say that, what do you mean? That is a relative term. *A.*—Well, I think I have seen several tons of it come in at a time, a very large number of bales.

Q.—How often have you seen that, doctor? *A.*—Probably two or three times a year.

Q.—How? *A.*—Probably two or three times a year, I should think.

Q.—Two or three times a year. How many tons would you think a year? *A.*—I could not possibly answer that question. That would be purely guess work.

Q.—Just simply guess work? It is a matter of record, isn't it? *A.*—I have not those records with me.

Q.—I say, it is a matter of record, isn't it? *A.*—Yes, they are all recorded.

Q.—You knew you were coming out here to testify, didn't you? *A.*—I did.

Q.—You knew what was wanted of you, didn't you? *A.*—I did not know that that was wanted of me.

Q.—You had talked this matter over with Mr. Hough a number of times? *A.*—Not that matter, no, sir.

Q.—Never had mentioned that matter? *A.*—No, sir.

Q.—Through how many years of that time have you noticed that carduus benedictus was coming into this country? *A.*—Since 1907, that is the only time when I have examined drugs.

Q.—How is that? *A.*—Since 1907. That is the only time that I have been examining these drugs.

Q.—Do you know where the carduus benedictus went to that came through the custom house? *A.*—I don't know where each particular lot went to.

Q.—Do you know where any of it went? *A.*—Oh, yes.

Q.—How many different consignees were there, do you know? *A.*—No, sir, but it don't stay in the hands of the consignee. The consignee imports it and sells it to a manufacturing house.

Q.—Who was the consignee? *A.*—I could not tell you, I never—

Mr. Hough:—You know what?

A.—I never know who the consignee is, sir.

Mr. T. J. Scofield:—You don't know what became of it after it left? *A.*—Yes, I do, because I know that it is for sale by the different manufacturing and jobbing houses, and so I know those manufacturers got it.

Q.—You know they must have got it all? *A.*—Oh, no.

Q.—Do you know whether any of it went to Chattanooga or not? *A.*—I do not know.

Q.—You don't know anything about that? *A.*—No, sir.

The Court: *Q.*—What is the size of those bales they come in? *A.*—They differ in size, your Honor. There is no regularity about the size of the bales. Some come in sacks, and some come in pressed bales.

The Court:—You referred to bales and I wondered what the approximate size was.

The Witness:—I should have said packages, perhaps, packages. We go by weight, however. It is always the weight that is stated, and I know they were large.

Mr. T. J. Scofield: Q.—What would the packages weigh?

The Witness:—I could not remember.

The Court:—You have estimated its weight at several tons, and I thought perhaps you could give us some idea of the size of the units approximately, and the number of units.

A.—No, your Honor. There would sometimes be a very large shipment, and at other times a moderate shipment, and the size of the bales would differ in any case, according to who it came from.

Mr. T. J. Scofield:—I think that is all I care to inquire.

REDIRECT EXAMINATION BY MR. HOUGH

Q.—Do you know whether those drugs are imported at any other port besides New York? *A.*—I do not know that, except by hearsay.

Mr. Hough:—I think that is all.

DEPOSITIONS

Three depositions were then read into evidence.

Adjournment was taken until Thursday, May 18, 1916, at 10:30 a. m.

May 18, 1916, Morning

TESTIMONY OF MR. JAMES HENRY M'FALL

The Court met pursuant to adjournment. Mr. James Henry McFall was called as witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. FOWLER

Mr. James Henry McFall testified that he has resided in Slayden, Tenn., for about eighteen years. He has been cashier of the bank since 1911. He is acquainted with Mr. J. J. Parrott, who lived about three quarters of a mile from his own residence. He has known Mr. Parrott for about eighteen years. This is the same Mr. Parrott who testified for the defendant. Mr. McFall testified that the general reputation of Mr. Parrott for truth and veracity is bad in the neighborhood in which he lives. From what he knows of Mr. Parrott and from his reputation Mr. McFall would not believe Mr. Parrott under oath.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

On cross-examination Mr. McFall testified that Slayden is a town of about 250 population. He testified that he has had business transactions with Mr. Parrott. Mr. Parrott owes him money, but it is not due. He has lent Mr. Parrott money twice since the bank has been there. The last note was renewed a short time ago.

The witness testified that Mr. Richter came to Slayden as representative of the Chattanooga Medicine Co. and made arrangements with him to come to Chicago, for which he receives a per diem with expenses.

TESTIMONY OF DR. WALTER R. SCHUSSLER

Dr. Walter R. Schussler was called as witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. WALKER

Dr. Walter R. Schussler testified that he is a physician residing in Orland, Ill. He was graduated from the Bennett Medical College in 1889. He is a member of the Illinois State Eclectic Medical Society, the National Medical Association, and is an ex-member of the Illinois State Board of Health. He has been professor of orthopedic surgery in the Chicago College of Medicine and Surgery. Years ago he taught thera-

peutics at the Bennett Medical College. He has been surgeon of the Wabash Railroad Company for 25 years.

The witness testified that he does work in the Frances E. Willard Hospital, the St. Bernard Hospital, the Englewood Hospital, the Jefferson Park Hospital, etc. He was a member of the state board of health from 1906 until 1913. When he graduated from the Bennett College it was an eclectic medical college.

The witness testified that he practices both medicine and surgery; he is familiar with the diseases peculiar to women. He stated that he has treated such conditions for 27 years. About one fourth of his practice is among women. He has treated them from puberty to old age. He has performed operations on the female organs. He believes that about 90 per cent. of the diseases of women are nonsurgical.

Dr. Schussler testified that he has treated prolapsus medically, and has obtained good results from the use of medicine and general treatment. He has used viburnum prunifolium almost daily for 27 years in the form of Lloyd's Specific Tincture. He assumes the proportion of alcohol is about 40 per cent.

Dr. Schussler testified that he has read about carduus benedictus and has heard physicians discussing it. He has not used it in his practice. From what he has learned of it and from what he has read about it, he considers carduus benedictus a valuable remedy. He taught therapeutics only during one session of the college year. He understands the use of drugs in combination—synergistic action. He does not pay any attention to the alcohol content of drugs which he prescribes. He makes a distinction between alcohol as alcohol, and alcohol as a menstruum. When alcohol is given as alcohol in the form of whisky it is given as a stimulant in doses of one half of an ounce to an ounce and a half. Fifty or sixty per cent. of whisky he considers is alcohol.

The witness testified that he would not consider a drug or medicine containing 20 per cent. of alcohol given in diseases of the female reproductive tract as deleterious by reason of the alcohol when these conditions were not surgical. He stated that invariably he had good results with the use of viburnum prunifolium. He has had no bad effects from the alcohol content in the preparation.

Dr. Schussler testified that he would consider carduus benedictus a tonic medicine, having a special effect on the portal circulation or on the uterus. He prescribes 5 to 15 minims of Lloyd's Specific Tincture of viburnum prunifolium, or 5 to 15 grains of the powdered drug. He has used viburnum in cases of uterine displacement which did not require surgical operation. He believes that medicine will aid cases of inflammation such as endometritis and testified that a special tonic will assist in overcoming engorgement and restoring the natural function of the organ.

Dr. Schussler testified that women very frequently suffer pain at the time of puberty. He treats such cases with medicine containing alcohol, and does not believe that the alcohol would have any tendency to heighten the passions. He testified that he has never prescribed Wine of Cardui.

The witness stated that there would be no toxic effect from the alcohol in a medicine similar to Wine of Cardui, and that if given to a girl at puberty it would not tend to give her an alcoholic habit. He would not hesitate to give such a medicine to a girl at puberty. He does not believe that all girls should take medicine at puberty, but they should take some when they have pain. He does not think the medicine known as "Wine of Cardui" would do a girl any harm. He stated that there are many cases during the menopause that require medicinal treatment.

Q.—I am speaking now as you understand me, not when the symptoms are accompanied with some disease like malaria or any other disease, but from the symptoms that arise from this change of life itself. Do you understand what I mean? *A.*—The change of life usually—

Q.—Like morning sickness.

Mr. Hough:—That is not right.

Mr. Walker:—I get that mixed up. On two occasions I have had a woman with change of life, pregnant, and I wish to withdraw it. I am not engaged in miracles here, doctor, at all. But I am speaking of the menopause and I want to know if there are any distressing symptoms, flushing of the face and so forth that accompany it, for which medicines may relieve? *A.*—There are.

Dr. Schussler described some of the conditions which may occur during the menopause which may be treated medically. He would consider medicines like Wine of Cardui to be general and special tonics. Medicines containing the same ingredients would be indicated in the various conditions arising during the menopause. He stated that a medicine similar to Wine of Cardui would be of assistance to the newly married woman and would not be harmful. He would not consider that a medicine like Wine of Cardui would mask a cancer.

The witness testified that he has not read the Home Treatment Book for Women issued by the Chattanooga Medicine Company, and that he is familiar with the conditions known as vaginitis. There was then read to him from this book "that the most frequent cause of vaginitis is gonorrhea brought on by infection, sexual excesses or unhealthy discharge from the womb, ovaries, tubes or bladder." He stated that gonorrhea cannot be brought on by sexual excess or unhealthy discharge as mentioned. The germ of gonorrhea must be present.

The witness mentioned some of the various causes of vaginitis. He stated that leukorrhea is a symptom of disease. The treatment of gonorrheal vaginitis would include douches, rest, hygienic conditions and tonics. He stated that in gonorrhea there would be no effect from the alcohol in a tonic containing 20 per cent. of alcohol; it would not tend to increase the microbes. He makes a distinction between alcohol given as alcohol, and alcohol which is a menstruum. Eclectics prescribe in such conditions cimicifuga, gelsemium, digitalis, golden seal and sometimes viburnum.

Dr. Schussler stated that a woman can hardly ever tell if she has prolapsus. She could not make a correct diagnosis of any of the female diseases. If the womb was in reach of the finger she could determine that she had prolapsus. She could tell that the difficulty was in the female organs without being able to name exactly the condition. He stated that the information given by the patient is always important in arriving at a diagnosis.

The witness stated that the injection of viburnum into the wall of the uterus in a mixture containing 40 per cent. of alcohol and the fact that the uterus did not contract would not be any test of the efficiency of the drug when taken through the mouth in the treatment of female diseases. The same was true of Wine of Cardui similarly injected. The fact that pituitrin was injected and produced a definite action would not, in his opinion, be any test that Wine of Cardui was inefficient when taken through the mouth. In his opinion the fact that Wine of Cardui showed no physiologic action on animals under anesthesia would not be a test of its efficiency in illness of women when taken through the mouth.

Dr. Schussler stated that medicines are frequently indicated in pregnancy when there are symptoms accompanying pregnancy that indicate an unnatural condition. A tonic would very often be indicated. There are frequently nervous systems which occur during pregnancy when tonics and sedatives are indicated. Viburnum would be indicated under such conditions, and viburnum would be decidedly indicated, he believes, in cases of threatened abortion. In cases of pregnancy when menstruation may occur usually medicine is not indicated. During pregnancy, he stated, child bearing may be made easy by toning up the general system. If medicines are given for this purpose, 20 per cent. alcohol as a menstruum would not be injurious by causing kidney difficulty, creating a habit, or by injury to the fetus. Such a medicine would have no deleterious effect.

The witness described some of the causes of sterility. He described vicarious menstruation and stated that viburnum would be a good remedy to use under such conditions. He stated that there is a relation between the breasts of a woman and the organs of generation, and in a general way by restoring the vital organs to a natural function the medicine might cause the breasts to be built up and assume their natural condition.

CROSS-EXAMINATION BY MR. T. J. SCOFIELD

On cross-examination Dr. Schussler testified that he has an office in Chicago and one in Orland. He has cases at present in St. Bernard's Hospital and one patient in the

Frances Willard Hospital. The surgical cases are taken to St. Bernards. His district for the railroad is from Englewood to Essex. He is an eclectic physician. He usually buys the viburnum from Fuller and Fuller. He gives it in capsules. He gives Lloyd's Specific Tincture when he gives it as a fluid. He does not carry it with him in his medicine case. He does not always give it in the dosage suggested on the bottle; he sometimes gives it in larger doses; in fact, quite frequently. It is his understanding that the same dosage of viburnum prunifolium does not meet all conditions. In some conditions you would have to use one dosage and in other conditions you would have to use another dosage.

Q.—What is that, doctor? *A.*—Some patients are very susceptible to the action of drugs; and in those cases a small dose will give better results; while in other cases, the patient is larger, the circulation is more active, and, consequently, I deem it necessary to give a larger dose.

Q.—Now, that—

THE COURT:—How do you determine or discover that personal idiosyncrasy? *A.*—I discover that by the general condition of the patient; for instance, the condition of the tongue; the condition of the circulation; the general vitality of the patient. In some patients a large dose would cause nausea, the stomach would not tolerate it.

Q.—What I am getting at is this—you don't get that in the first instance? That is something you learn either from the patient or from your experience with that patient, after a while? *A.*—No; not always; will—

THE COURT:—Tell me—make it shorter—can you tell the minute you see the patient, whether they are unusually susceptible to drugs or not; whether they need a large dose or a small dose? *A.*—Usually we can tell whether they need the small dose or the large dose; but we cannot always tell the idiosyncrasy at once; that requires some time.

Mr. T. J. Scofield: *Q.*—Now, doctor, usually, if I understand you, when you see the patient, you can tell whether you can give her a small dose or a large dose; you can usually tell that, can't you, when you see the patient? *A.*—I can—I would arrive at my judgment.

Q.—Yes? *A.*—I cannot tell positively.

Q.—No. Now then, I suppose also the size of the dose depends on the condition, doesn't it? *A.*—It does.

Q.—Yes. And you reach a conclusion as to the actual conditions by the examination which you make, I suppose? *A.*—Yes, sir.

Q.—That is, not only by your physical or digital examination, but taking into consideration also those subjective things which you say form a part of the diagnosis; taking all that together, then you reach your own conclusion as to whether the dose should be large or small? *A.*—I do.

Q.—Now then, what are some of the conditions, doctor, that you might find in the treatment of which you might require a large dose? Oh, just a few; it doesn't matter about how many. *A.*—In conditions where the stomach seems to be healthy and in conditions to assimilate the drug readily, and thereby obtain the physiological effect of the drug, I deem that it can be given in larger doses, and perhaps obtain results sooner than I could if the stomach was irritable and the patient would be inclined—it would be inclined to nauseate the patient, and thereby perhaps do harm. In those cases then we would give the drug in smaller doses, so that the stomach can be—can assimilate the medicine.

Q.—Then you do not think, do you, doctor, that it would subserve the purposes of your practice, at least according to your view, if you could give uniformly to every patient and for every condition, the same amount of viburnum prunifolium, or any other drug? *A.*—No, sir.

Q.—No. You have found, as the result of your experience, that there is no common—no one certain amount that will answer in all conditions, or for all purposes? *A.*—There is no fixed rule.

Q.—So that is your treatment, after you have diagnosed the conditions and become familiar with your patient, you give the dosage, or the size of dose, which your experience and your knowledge of the case indicates to you to be the proper one to give? *A.*—I do, yes.

Dr. Schussler stated that the smallest dose would be five minims, and the largest dose would be about fifteen or twenty drops of the specific tincture. Eight or ten drops would be an average dose, and the witness judges that of this there would be about four drops of alcohol. He considers that amount of alcohol negligible. It would be given about every three hours until there was indication to change the drug or until the patient recovered. The length of time would depend on the illness with which the patient was suffering, and the duration of that illness. Most of the time he prepares the medicine for the patients himself. After the patient's treatment is completed he does not leave more medicine for him to take unless he gets sick again.

Dr. Schussler stated that he also uses gelsemium, golden seal and cimicifuga, prescribing the liquid more frequently than the powder. He gets good action from the powder. The dose of gelsemium which he gives depends on whether the patient is a child or an adult, and on the urgency of the condition. Sometimes he gives gelsemium every two or three minutes until the antispasmodic effect has been obtained, sometimes this is obtained in fifteen or twenty minutes. In a small child of 4 or 5 years of age he would give two drops to a teaspoonful of water in a single dose. This would be repeated every five minutes until convulsions subsided. He usually gets results in an hour's time. The patient would have twenty-four drops in that time, of that about eight or nine drops would be alcohol. He would administer the specific medicine of gelsemium to adults in five to eight drop doses in one dram of water. This would be given once every two or three hours until the physiologic effect manifested itself. He usually prepares about half a tumblerful—about 4 ounces—and in this there are about fifty drops of alcohol. The patient gets twelve doses in twenty-four hours; this would be continued another twenty-four hours if necessary. He considers the amount of alcohol negligible.

The witness testified that he gives nux vomica in smaller doses. He has had no personal experience with carduus benedictus. He knows of the *Eclectic Medical Journal*. He is not acquainted with Dr. Felter, the editor, but is acquainted with his predecessor, Dr. Scudder. He reads the journal occasionally. He would give some weight to the opinions of Drs. Felter and Scudder expressed editorially. He did not read the article on cnicus benedictus published October, 1915.

The witness spoke of the action of drugs in combination as synthetic action. The effect is usually good when the drugs are compatible. (He stated "you get the action of the drug by giving half the dose that is ordinarily given when the drug is given by itself.") You get the sum of action of the two drugs. This he considers the same as synergistic action.

Whereupon the case was adjourned until 2 o'clock p. m. of the same day.

May 18, 1916, Afternoon

The Court met pursuant to adjournment. Dr. Walter R. Schussler resumed the stand as witness for the plaintiff in rebuttal.

FURTHER CROSS-EXAMINATION BY MR. T. J. SCOFIELD

The witness stated that he prescribes in various conditions according to the cause. He does not always prescribe the same dosage. There was described to the witness a hypothetic case in which the patient could feel the cervix or mouth of the womb about an inch from the outside, this condition having existed for a period of four years. He stated that neither viburnum nor carduus benedictus, nor the best combination of the two in a 20 per cent. menstruum of alcohol, could lift that uterus to its proper position inside of three weeks or any other time.

REDIRECT EXAMINATION BY MR. WALKER

Q.—A derrick could not do it, could it? *A.*—No sir.

Q.—For how long a time do you think a woman would know that her womb was in that position herself, if it had run for four years? *A.*—Perhaps within a week or ten days.

Q.—After it started? *A.*—Yes.

Q.—So that she would know all about that condition for nearly four years? *A.*—Four years.

The witness then stated the various symptoms which would accompany such a condition, and testified that a tonic would benefit the patient. Douches, medical treatment, the knee chest position or other positions would be of benefit.

The witness stated that in prescribing nonpoisonous drugs not much attention is paid to the dosage as with poisonous drugs. It does not make much difference unless the patient has nausea and if not too vast an amount is given, if the drugs are nonpoisonous.

UTILIZABILITY OF ALCOHOL

Dr. Schussler was asked if he knew THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and he had read an editorial in THE JOURNAL for December 11, 1915, on the subject of utilizable alcohol. He had not read the article. Mr. Walker then offered in evidence a query and minor note from THE JOURNAL, p. 2108, on the subject of utilizable alcohol. The query and minor note follows:

> "To the Editor.—The amount of alcohol which can be oxidized by the adult human being in 24 hours, that is, serve as a food, has been determined by a physiologist and formulated into a law. Can you inform me concerning the name of the physiologist, and the amount of alcohol that can be utilized? S. C. Mecklin, M.D., Pittsburgh.

"Answer:—The maximum dose of alcohol has been estimated at 15 grams per day. Such an amount can be taken without causing the alcohol tension in the blood to become so high that more than the usual amount will be excreted in the kidneys and lungs. It has long been known that 90 per cent. of alcohol ingested is burned in the blood. Atwater and Benedict within the last few years have determined that as much as 99 per cent. of alcohol ingested undergoes combustion in the organism when the amount of alcohol ingested per day is equal in quantity to that contained in six ounces of whisky. It is well known that alcohol tolerance depends largely on habituation of the individual to this substance. In other words, greater combustion of alcohol occurs in the tissues of a steady drinker than in the habitual abstainer. We are unable to find any reference to the formation of a law for the determination of the alcohol utilized in the human body."

DEPOSITIONS

Thirteen depositions were then read in evidence.

Whereupon an adjournment was taken until the following day, May 19, 1916, at 10:30 a. m.

May 19, 1916, Morning

TESTIMONY OF DR. EFFIE L. LOBDELL

The Court met pursuant to adjournment. Dr. Effie L. Lobdell was called as a witness for the plaintiff in rebuttal.

DIRECT EXAMINATION BY MR. WALKER

Dr. Lobdell testified that she is a physician and surgeon residing in Chicago. She graduated from the Ft. Wayne College of Medicine in 1891. Soon after she received an appointment to the staff of the Hospital for the Insane at Kankakee. She worked one day a week in examining cases and had in her care 200 to 500 cases each day. Later she studied in Vienna. She was eight years on the staff of the Mary Thompson Hospital, five years on that of the Frances Willard Hospital and four years in the Cook County Hospital. She was at one time herself superintendent of a hospital and taught in that institution. She is not now regularly connected with any hospital but attends patients in the various hospitals. She practices especially in obstetrics and women's diseases. During the month of March, she had 150 cases of which 13 were operative and ten were obstetric. She treats daily from four or five to twenty-five patients.

She testified that she has been called in many girls' schools and stores and that many of the dry goods stores keep medicine for the relief of young women. Objection to this question was made and overruled.

Dr. Lobdell stated that she has performed the cesarean operation and is familiar with cancer. She has treated female diseases from the age of four to late in life. She has treated women during puberty, pregnancy and the menopause.

Q.—Doctor, is there anything peculiar as distinguished from other pain and conditions generally, of the pain that accompanies either young girls or women at the time of the monthly periods? *A.*—Yes, sir, it is a peculiar kind of pain.

Q.—Just please tell me what you mean by that? *A.*—Well, it is, I should say different from the pain of any other part of the body, or any other class of symptoms. It is a spasmodic and of neuralgic character, such as we understand to be neuralgic in character. It is quite different from other pains.

Q.—Would all women who require assistance for some disturbance of the female functions—what proportion of those are surgical cases as distinguished from medicinal cases? *A.*—Rather a small percentage, considering the entire number that require attention.

Dr. Lobdell stated that 10 or 15 per cent. of the cases require surgery. She testified that 90 per cent. of the young girls suffer pain and other distressing symptoms at the time of puberty.

Q.—Doctor, in that 90 per cent. where those symptoms are present, do they require or is it legitimate to give medicinal treatment? *A.*—It is.

Q.—Take instances of that kind, what do you give? *A.*—My most common remedy is viburnum compound or combination, the viburnum—simply a combination in which viburnum is one of the principal ingredients.

Q.—Have you ever used Hayden's Viburnum Compound? *A.*—Yes, sir; before other ones were perfected.

Q.—What percentage of that was alcohol? *A.*—Hayden's is 50 per cent. alcohol.

Q.—You understand, doctor, do you, that I am speaking of the epoch of puberty? *A.*—Yes, sir.

Q.—Now, take those cases, what consideration if any, do you give to the alcohol? *A.*—Nothing at all, only that it is rather, I think, a good thing at that time.

Q.—Now, Doctor, have you used any other drugs containing alcohol in various conditions for female distresses and troubles? *A.*—Yes, sir; in combination, like the Helionin Compound or Liquor Sedans of Parke, Davis & Company, and there are various good preparations on the market made by the various pharmaceutical houses, which I think are better than the usual prescriptions.

Q.—What was the first one you named? *A.*—Helionin Compound.

Q.—What alcohol does that contain? *A.*—That contains about 48 per cent., I think.

Q.—What was the other please? *A.*—Liquor Sedans.

Q.—What does that contain? *A.*—That contains less, about 28 per cent.

Q.—I don't know whether you used those in cases of distress at puberty or not? *A.*—Yes, sir; they all belong to the same class of remedies.

Dr. Lobdell testified that when she was on the staff of the Insane Hospital, there were many cases where the mental conditions were due to pelvic disturbances. These were treated medicinally and many of them relieved. Dr. Lobdell testified that she is actively interested in cases where women are brought into court. She helped introduce the examination of girls in the Juvenile Court, Morals Court and Criminal Court, etc. She was president of the Women's Club of the City of Chicago until this year. She is a member of the Chicago Medical and Illinois State Medical Societies. She was formerly a subscriber for THE JOURNAL.

Mr. Walker: Q.—What medical journals, doctor, do you subscribe for, in your reading of the medical journals? *A.*—Well, I only subscribed for the last year, I think for two, the *Johns Hopkins, Experimental Medicine* and *Clinical Reports*.

Q.—Do you get any German or Italian studies on that subject? *A.*—No, my textbooks are German. I have German textbooks.

Dr. Lobdell testified that she has treated prolapse of the uterus satisfactorily by medical measures in cases which did not require surgical measures. She has always considered that viburnum prunifolium has therapeutic value and still uses it. Recently at the request of Mr. Walker, she has informed herself concerning carduus benedictus. She has an opinion not from her reading but from consulting with a German pharmacist on the North Side who prepares it for physicians. The Court ruled that such evidence was incompetent. She formed no opinion from her reading.

There was then described to the witness the experiment performed by Dr. John Clarence Webster. She stated that she would not expect the uterus to show any reaction because the fluid injected was an antispasmodic. The Court ruled that this was not the correct answer to the question. The witness then answered that in her opinion such an experiment was no proof that the drug injected had no therapeutic value when taken by mouth.

Mr. Walker: Q.—Doctor, suppose that same substance was injected into a dog or other animal through the respiratory or circulatory system, or while those were being watched, would the fact that nothing was observed in that connection be any evidence in your opinion as to whether that drug was of therapeutic value, or that compound of therapeutic value upon a sick woman?

Mr. T. J. Scofield:—That is objected to for the same reason.

THE COURT:—She may answer.

To which ruling of the Court the defendants, etc., excepted.

A.—I would not know because I am not familiar with the use of drugs on the lower animals.

Dr. Lobdell stated that the giving of the hypothetic medicine to a girl at puberty would not, she believed, heighten the passions. The Court ruled that in the future questions, the cnicus benedictus be eliminated as the witness stated that she knew nothing about it.

Dr. Lobdell stated that she considers the alcohol in 20 per cent. solution, 48 drops to a dose, is negligible. The witness stated that a tonic would frequently be indicated for the symptoms accompanying pregnancy, that there are no objections to alcohol in pregnancy in moderate doses.

Q.—Do you know anything about the giving of wines or gin and champagne to women during those periods? *A.*—Yes, sir. It is sometimes not only necessary, but we do it as a sort of diet where we want to control the size of the child, and various things of that sort.

Q.—When you were in Europe, Doctor, did you notice whether or not in pregnancy any stimulants of that kind were given? *A.*—They were allowed, the wines of the country, clarets and beers, light beers as a part of their diet.

Q.—Take the medicine that I have alluded to, and state whether or not in your opinion that would have a detrimental action, if given in those doses, on the kidneys of a woman when she was in that condition? *A.*—No, sir; it is not known to have.

The witness stated that some cases of sterility may be treated with drugs given by mouth. There is an intimate connection between the breasts and the genital tract in a woman, she stated, and she would expect a tonic to have an effect on the breasts by toning up the system. She distinguishes between a tonic and a stimulant by the time which it takes it to act; the stimulant gives immediate action; a tonic has a continued effect. In her opinion, a drug may be both a tonic and a sedative; examples are viburnum and alcohol. The witness stated that in her opinion, a tonic medicine containing 20 per cent. alcohol, 48 drops to a dose, would not mask the symptoms of cancer.

Dr. Lobdell prescribes hygienic treatment for slight prolapse. She stated that in vaginitis, antiseptic douches are indicated. She stated that in metritis and endometritis, medicines are given by mouth to counteract the disagreeable effect of these conditions and that medicines of the class of viburnum prunifolium are usually prescribed. She gives medicines combined, as the combined action of the two gives less necessity for large doses. The witness stated again that alcohol in a solution of 20 per cent. in the dosage of 48 drops would not, in her opinion, increase the passions of a young girl.

Mr. Walker: Q.—Why not, doctor? *A.*—In the first place the ingredients themselves are antispasmodics and when a young girl is having the distressing effects of an approaching menstruation, she is over-stimulated naturally, that is the physiological condition. If it is extreme, it of course is distressing and any drug, any antispasmodic or anything given that would relax and relieve the internal congestion and bring the blood to the smaller vessels, particularly the skin (which is controlled by the same set of nerves practically as the internal organs), she would be relieved of those distressing symptoms and it would be a sedative in her case.

Q.—Independent of the medical feature, doctor, of the thing, what are the usual home remedies, if you know, in those cases? *A.*—Well, I suppose the most common remedy is gin.

At this point defendants' counsel objected but the objection was overruled.

The witness stated that sexual excess without the presence of a germ cannot produce gonorrhea.

The Court:—Is there any doubt about that?

Mr. Walker:—I do not know.

The Court:—It seems to me that all the witnesses for the defendant testified that that was a germ disease.

Mr. Walker:—Well, this seems to say that gonorrhea is brought on by sexual excess. I want to be able to go to the jury on the lack of grammar in this sentence, when the time comes, and explain it.

The Court:—It is not disputed. You can attack the grammar of that book as much as you please, the English, rather.

Mr. T. J. Scofield:—We have no fault to find with its grammar and no contention to make either way.

Mr. Walker:—I understand what your contention is.

Mr. T. J. Scofield:—I do not know whether you do or not.

Mr. Walker:—Well, I will make an attempt at it and I think the jury will understand me when I say that I shall get—

The Court:—The jury and I will take another recess, gentlemen, if you don't get busy on this case.

Mr. Walker:—All right, Your Honor, will pardon me for just a moment.

Dr. Lobdell then stated some of the disagreeable symptoms accompanying the menopause, and stated that the hypothetic medicine would be more apt to be beneficial than otherwise. The witness stated that tonics are indicated in amenorrhea, dysmenorrhea, menorrhagia, and metrorrhagia and that viburnum prunifolium would be one of the remedies indicated. This remedy in a solution containing 20 per cent. alcohol given in a dosage of 48 drops would not be detrimental.

Viburnum prunifolium, Dr. Lobdell stated, would be a proper drug for threatened abortion and that the fact it was in 20 per cent. alcohol, a dosage of 48 drops would not make it objectionable.

(To be continued)

Correspondence

The Pay Consultation Clinic at the Massachusetts General Hospital

To the Editor—Two reasons led to the establishment of the pay consultation clinic which was opened at the Massachusetts General Hospital, Jan. 25, 1916: One was the desire to make the facilities and staff of a large general hospital available to the practitioner in his care of patients of moderate means. The other was to enable this group of patients to obtain the benefits of a complete range of skilled advice and expensive equipment at a fee within their reach.

It is intended that both the family physician and his patient shall be benefited. If not accompanied by his physician the patient is required to bring a letter from him, which is a guarantee that the person to be admitted belongs in the group for which this clinic is intended. Experience with the 700 patients so far received shows that the family physician is making legitimate use of the opportunity. Two or three patients outside of those "of moderate means" have been noted, but it is expected that even this small number will be reduced by the consideration of the doctor who asks for a diagnosis and advice.

After a sufficient number of visits has been made for the clinic physician to establish a diagnosis, a letter is sent to the family physician summing up the opinions of the consultants, together with the evidence given by the Roentgen-ray department and laboratories. The treatment that seems advisable to the consultant is suggested to the patient's physician. The patient is not treated, and after the diagnosis is made he does not return except at the request of his physician. Each of the New England states has contributed its interesting and difficult cases to the total of over 700 patients so far seen in the clinic.

The clinic seems to be a concrete expression of thoughts that have existed in the minds of some of the more progressive men in and outside of the profession of medicine.

Before the consultation clinic was established, the opinions of 100 representative physicians and surgeons in and around Boston were ascertained regarding such a step. The sixty replies received endorsed the idea without exception.

Recently fifty-nine replies have been received from letters sent to physicians who have sent cases to the clinic. One has considered it a failure; fifty-eight have found it of great help and expressed their appreciation of it, and ten of this number have made some minor suggestions by which the clinic could be made of still greater assistance to them.

Algernon Coolidge, M.D., Charles A. Porter, M.D.,
Richard C. Cabot, M.D., Charles L. Scudder, M.D.,
David L. Edsall, M.D.,
Frederic A. Washburn, M.D., Secretary,
General Executive Committee.

Blood Transfusion Apparatus

To the Editor:—Noting your article on methods of blood transfusion (Therapeutics, The Journal, June 17, 1916, p. 1923), may I call attention to the advantages of the Abelmann syringe method which you illustrate? This simple instrument makes it possible for one operator to transfuse blood with certainty and ease. I have performed over a thousand blood transfusions, without any assistance whatsoever. The apparatus is also admirably adapted for administering salvarsan. With all my transfusion work, I have had no fatalities and during the past year have had no alarming symptoms develop as the result of administering incompatible blood. The biologic test for blood incompatibility developed by this method is more delicate and reliable than the laboratory tests, and can be made in a few minutes. The blood is taken at chosen intervals, giving such measured quantities as the condition warrants. The results obtained in treating certain chronic conditions in this way are better. The donors are also safeguarded and suffer no ill effect. The danger of transmitting disease from the patient to the donor is

eliminated. The danger of air and clot emboli, as well as thrombosis and infection, is nil. The rate of flow of blood into the patient's vein is under absolute control. The simplicity of method and apparatus eliminates technical difficulties, and places the transfusion of blood in the hands of the general practitioner, widening the field of its usefulness. The apparatus is compact, can be carried in the coat pocket, is easily sterilized and prepared, and can always be kept ready for immediate use. The method requires no cutting, and consequently there will be no offensive scars, no destruction of blood vessels and nerves, and no wasting of blood. Ambulatory patients can be treated in the physician's office in a short time. Donors are readily secured on account of simplicity, safety and convenience. Recipient and donor can be in separate rooms. The operation requires no speed or dexterity. On the whole, therefore, the syringe method should appeal to the average physician as the most desirable routine method.

HENRY W. ABELMANN, M.D., Chicago.

Esophageal Stricture

To the Editor:—In a recent issue of THE JOURNAL (April 15, 1916, p. 1198), Dr. Anthony Bassler states that the surgeons failed to give him the aid and comfort he expected, in a case of esophageal stenosis.

I have noted no answer to the letter, and as the same trouble may occur to others, and the measures to obviate it are simple, I am giving three methods, any one of which would be efficient in such a case, but of which some one might appeal more than another to the individual case, or operator.

1. The oral end of the cord may end in a material which the child cannot bite through—leather, wire or chain.

2. The oral end may be fastened by a dental ring to a tooth, the ring being easily removed by the physician.

3. The simplest means of all, which is applicable to the largest number of cases, is to bring the upper end through the nasopharynx, and out through the nose, where a piece of adhesive plaster would anchor it.

Probably other men would give other methods.

FREDERICK S. WEINGARTEN, M.D., New York.

Request for Surgical Instruments

To the Editor:—Mrs. Russell A. Alger, Jr., of Detroit, has just returned from a trip to France. While there, she visited many hospitals, especially throughout Brittany, where thousands of wounded soldiers are being treated. Everywhere she heard a most urgent cry for all kinds of surgical instruments, especially in the hospitals of the country.

Mrs. Alger has asked me to request you to appeal with all the earnestness and publicity you can to the physicians throughout the land to donate any instruments, no matter how simple, which they have no further need of or may spare, the same to be sent to Mrs. Russell A. Alger, Jr., 2030 Penobscot Building, Detroit, Mich., from which place they will be forwarded without expense to the donor to France, to be distributed to the hospitals most in need of them.

Permit me to add my personal appeal to you to lend your influence to this cause. The need is urgent and the gratitude of thousands of soldiers awaits your action.

ANDREW P. BIDDLE, M.D., Detroit.

Inhibitory Properties of Magnesium Sulphate and Their Therapeutic Application in Tetanus

To the Editor:—I have discovered an important omission in my article on this subject (THE JOURNAL, March 25, 1916, p. 931), an omission which may have practical consequences. On page 934, second column, the first paragraph of the summary reads: "In each and every case of tetanus, 1.2 c.c. of a 25 per cent. solution of magnesium sulphate should be given by subcutaneous injection," etc. It should read: "1.2 c.c. of a 25 per cent. solution of magnesium sulphate *per kilogram body weight.*"

S. J. MELTZER, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

ADVISABILITY OF FAMILY USE OF PATERNAL AUTOGENOUS VACCINE

To the Editor:—In a family of four, who had previously been exceptionally healthy, four months ago "influenza" developed in very acute form. Since that time there have been recurrences in all of the family. In the girl of 12 there was unusually severe nosebleed. In the boy of 6 there was intestinal hemorrhage. There has been double external ear abscess in two of the family, peritonsillar abscess in one, and something very nearly akin to multiple neuritis in two. In one of these the condition simulated erythema nodosum with intestinal involvement. In this one there have been several articular inflammations during these months. In such a family would it be good treatment to use in the other members of the family a vaccine made from the father's nostrils, throat and ears, during a time when he had an acute attack of pharyngitis with involvement of eustachian tubes, and just after external ear abscesses had been lanced?

A. C. B.

ANSWER.—The family epidemic here described is apparently similar to many others which have occurred throughout the country in the past months. In those which have been investigated bacteriologically, the organism most frequently found has been a hemolytic streptococcus; the term "influenza," of course, is meaningless. The complications, such as articular inflammation and erythema nodosum here described, are also those which have commonly been found in streptococcal infections.

Recurrences of the symptoms of infection suggest a lighting up of the original infection, which has probably persisted, partially protected, in some part of the patient's body. Each patient should be carefully studied, and if any local collection of pus in a small persistent tonsillar abscess, or in the ear, is found, this should be drained. If one will think of the relation of such a small deep seated abscess to the surrounding tissues, one would not expect to accomplish the drainage of the pus by the injection of vaccines into some other part of the body, but would rather attempt to relieve tension and absorption from this abscess by incision. When the focus is removed, improvement follows without the use of vaccines.

In patients with severe and extensive infections such as those described, recovery is largely a matter of increasing resistance to infection by improving nutrition, and where this is possible, by the eradication of areas in which the infecting organism is growing. Vaccines have accomplished much in the prophylaxis of disease such as typhoid fever, but careful clinical observers have not found that favorable results can be regularly anticipated from the use of vaccines in situations such as those described.

For these reasons it would not be good treatment to inject into other members of the family a vaccine made from the father's nostrils, throat and ears during an acute attack of pharyngitis, even assuming the father to be suffering from the same infection as other members of the family. Such a procedure is undesirable because it probably will do no good and may do harm.

HEAT CRAMP

To the Editor:—As a result of natural gas facilities, we have many zinc smelters in this district. The furnaces are extremely hot, and consequently the furnace men are exposed to an almost unbearable heat. After they are "burnt in," however, the heat does not seem to affect them. Frequently a man takes on a "double shift" or does another's work and gets very hot for a prolonged time; he naturally goes out, after his work is done and imbibes freely of ice water. This throws him into the most violent muscular contractions of the arms and legs. The muscles knot up in huge cords, and he goes down in a heap in apparently the most frantic agony. The pulse is normal as well as the temperature. The convulsive seizures come at intervals of from two to fifteen minutes, and in the severe cases are absolutely unaffected by any amount of opiates that will allow the patient to breathe. Chloroform relaxes the spasms for the time being, but they usually return again in a few hours. The patients usually recover in from a few hours to a few days; but a few have been lost, apparently from exhaustion.

This condition may not be new to those having experience with furnace men, but I have never seen anything in the literature or books describing it or giving the pathology. I desire an explanation or direction for data.

P. S. MITCHELL, M.D., Iola, Kan.

ANSWER.—Heat cramp is produced by a combination of intense heat and hard work. The disease is more frequent in summer than in winter, and the use of alcohol probably

plays a minor part as a predisposing cause. The principal symptoms are well enumerated in the case described. The condition has been ascribed to a deficient serosity of the blood with acute degenerative change in the muscles. The prophylactic treatment is, of course, as much ventilation as possible where the men are working. Cool oatmeal water or similar drink should be used rather than ice water. For the acute condition morphin seems to be generally recommended, although, as noted above, opium in large doses may have little effect in some cases. According to H. M. Welsh (THE JOURNAL, April 10, 1909, p. 1179), apomorphin, in doses varying from $\frac{1}{12}$ to $\frac{1}{20}$ grain, will produce immediate relaxation; he has employed this remedy with success in the severer cases. Warm baths are also recommended to relax the spasm.

This subject was discussed in Queries and Minor Notes, THE JOURNAL, June 1, 1912, p. 1706, and Nov. 9, 1912, p. 1734.

The following are further references:

Cameron, W. H.: A Disorder Due to Exposure to Intense Heat, THE JOURNAL, May 8, 1909, p. 1483.
Clendening, L.: Muscular Spasms Due to Heat in Cooks on Pullman Diners, THE JOURNAL, May 7, 1910, p. 1517.
Edsall, D. L.: *Tr. Assn. Am. Phys.*, xxiv, 625; *Wisconsin Med. Jour.*, 1910, p. 425.
Elliott, M. S.: *Mil. Surg.*, xxii, 227.
Mann, W. L.: *U. S. Naval Med. Bull.*, October, 1912.
Fiske, C. N.: Effect of Exposure to Intense Heat in Working Organism, *Am. Jour. Med. Sc.*, April, 1913.
Oliver, Thomas: Dangerous Trades, New York, E. P. Dutton & Co., 1902, p. 184.
Anders: Practice of Medicine, Ed. 12, 1915, p. 1296.

INJECTION OF PASTE IN DISEASE OF HIP JOINT

To the Editor:—I have a patient with tuberculous hip joint disease who was operated on some months ago. The head and neck of the femur were removed at that time. There is now evidently a relapse, and there is at the present time a discharging fistula in the inguinal region that is evidently draining the joint cavity. The patient—a girl 8 years old—is in good general health with the possible exception of a rise of about 0.8 degree in temperature each day. Would it be advisable to inject a paste through the fistula into the joint; if so, what kind of a mixture is being used in such cases at this time? The joint has been immobilized for the past month without apparent benefit. In replying, please omit my name. M. J. M.

ANSWER.—It seems quite evident from the foregoing letter that the tuberculous condition is still active, either in the joint or, more likely, in the bone. Before determining on any line of treatment it would be desirable to make some good roentgenograms to show the exact location and extent of the involvement. If sequestrums are still present, they may be removed before attempting to inject the sinus with paste. If all the dead bone has been removed and the cavity remaining is not too large, the use of bismuth paste, 30 per cent. of bismuth in petrolatum, sterilized and injected under proper pressure, may be tried. The joint should then be completely immobilized over a long period, even after the sinus is apparently closed. Many months are required for recovery to take place in these cases under the most favorable conditions.

REGISTRY NUMBER ON PRESCRIPTION BLANKS UNDER HARRISON LAW

To the Editor:—Does the Harrison Narcotic Law permit a physician to print his registration number on his prescription blanks? M. F.

ANSWER.—Yes. There is nothing in either the law or the treasury decisions thereunder which would preclude a physician from printing the registry number on his prescription blank. Treasury Decision 2172 holds that a physician can use any blank that is properly dated and signed and has indicated thereon the physician's address, registry number, and name and address of person for whom prescription is written.

TOXICITY OF ACETYLENE GAS

To the Editor:—I use acetylene gas to read by, the tube of the lamp being connected to an acetylene tank. After acetylene was turned on last night my throat troubled me and I coughed for a while. My secretary detected an odor and seemed to think it was the acetylene gas that caused the irritation in my throat.

C. de P. F., Peekskill, N. Y.

ANSWER.—Pure acetylene is very slightly, if at all, poisonous. The commercial product is generally prepared from calcium carbid and therefore contains such impurities as carbon bisulphid, carbon monoxid, each present to the extent of about 0.5 per cent., and phosphoretted hydrogen, 0.04 per cent. It is therefore slightly poisonous. The toxic effects of these impurities, even in larger quantities, is not such as to produce irritation of the throat. Naturally, should the carbon bisulphid be present in an altogether abnormally large amount, which is unlikely, then sulphur dioxid formed by combustion would be irritating to the mucous membranes of the throat and nose as well as to the conjunctiva.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALABAMA: Montgomery, July 10. Chairman, Dr. W. H. Sanders, Montgomery.

CONNECTICUT: Regular, New Haven, July 11-12. Sec., Dr. Charles A. Tuttle, 196 York St., New Haven; Homeopathic, New Haven, July 11, Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven; Eclectic, New Haven, July 11, Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

DISTRICT OF COLUMBIA: Washington, July 11-13. Sec., Dr. Edgar P. Copeland, The Rockingham.

INDIANA: Indianapolis, July 11-13. Sec., Dr. W. T. Gott, 84 State House, Indianapolis.

MASSACHUSETTS: Boston, July 11-13. Sec., Dr. Walter P. Bowers, 1 Beacon St., Boston.

NEW MEXICO: Santa Fé, July 10. Sec., Dr. W. E. Kaser, East Las Vegas.

OKLAHOMA: Oklahoma City, July 11. Sec., Dr. R. V. Smith, 502 Daniel Bldg., Tulsa.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 11-13. Sec., Mr. Nathan C. Schaeffer, Department of Public Instruction, Harrisburg.

SOUTH DAKOTA: Deadwood, July 11. Sec., Dr. Park B. Jenkins, Waubay.

VERMONT: Burlington, July 11-13. Sec., Dr. W. Scott Nay, Underhill.

WEST VIRGINIA: Charleston, July 11. Dr. S. L. Jepson, Charleston.

Colorado January Report

Dr. David A. Strickler, secretary of the Colorado State Board of Medical Examiners, reports the written examination held at Denver, Jan. 4, 1916. The total number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 4, of whom 3 passed, including 2 osteopaths, and 1 failed. Eleven candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
University of Pennsylvania		(1915)	86.4
	FAILED		
St. Louis College of Phys. and Surgs.		(1915)	53

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Chicago College of Med. and Surg.		(1913)	Illinois
Hahnemann Med. Coll. and Hosp., Chicago		(1913)	Illinois
Indiana University		(1910)	Indiana
University of Louisville		(1894)	Missouri
Tulane University of Louisiana		(1906)	Louisiana
Harvard University		(1898)	Mass.
University of Michigan Medical School		(1880)	Iowa
University Medical College, Kansas City		(1898)	Missouri
John A. Creighton Medical College		(1910)	Nebraska
Startling Medical College		(1882)	Illinois
McGill University		(1894)	Minnesota

Idaho April Report

Dr. Charles A. Dettman, secretary of the Idaho State Board of Medical Examiners, reports the written examination held at Boise, April 4-7, 1916. The total number of subjects examined in was 11; total number of questions asked, 110; percentage required to pass, 75. The total number of candidates examined was 17, all of whom passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
College of Physicians and Surgeons, Los Angeles		(1905)	80
University of Colorado		(1911)	84
Northwestern University		(1911) 84; (1914)	82
University of Illinois		(1913)	83
Medical College of Indiana		(1905)	83
Keokuk Medical College, Coll. of Phys. and Surgs.		(1905)	76
University of Louisville		(1905)	77
Beaumont Hospital Medical College		(1896)	79
Missouri Medical College		(1896)	84
National University of Arts and Sciences		(1914)	82
John A. Creighton Medical College		(1909)	83
Medical College of Ohio		(1900)	83
Ohio Medical University		(1900)	80
Jefferson Medical College		(1914)	85
Medico-Chirurgical College of Philadelphia		(1909)	85
University of Nashville		(1902)	79

Book Notices

CANCER OF THE STOMACH. A Clinical Study of 921 Operatively and Pathologically Demonstrated Cases. By Frank Smithies, M.D., Gastro-Enterologist to Augustana Hospital, Chicago. With a Chapter on the Surgical Treatment of Gastric Cancer. By Albert J. Ochsner, M.D., LL.D., F.R.C.S., Professor of Clinical Surgery in the School of Medicine of the University of Illinois. Cloth. Price, $5.50 net. Pp. 522, with 106 illustrations. Philadelphia: W. B. Saunders Company, 1916.

This monograph is composed of twelve chapters, eleven of which, covering the general features of the subject, including the nonsurgical treatment, are by Smithies, and one chapter on the surgical treatment is by Ochsner. The opening chapter, on general distribution and etiology, contains many interesting facts regarding the distribution, but nothing that can be said really to touch the etiology. It is to be expected that a disease as prevalent as cancer, which occurs, as a rule, after the individual has lived more than half of his expectancy, would be accompanied by many conditions such as healed tuberculosis, gallstones, syphilis, chronic infections, etc., without there being any causal relation between them; hence there is no sound reason for concluding that any of these incidental conditions bear any causal relation to cancer of the stomach.

The chapter on morbid anatomy is well illustrated, most of the gross specimens being from the Mayo Clinic, while the text follows closely that of McCarthy. Considerable space is devoted to symptomatology and examination, particularly to the examination of gastro-intestinal function. The author thinks there is no procedure which "enables one to estimate the status of a given case of gastric cancer so quickly, accurately and inexpensively, as does intelligent scrutiny of test meal data. There is no disease of the stomach per se which returns gastric extract analyses so characteristic as those exhibited in instances of what is clinically advanced gastric cancer."

One can easily agree with both of these statements, for in the first the diagnosis is assumed in "a given case of gastric cancer," and the second statement deals with "what is clinically advanced gastric cancer." When it comes to making a diagnosis in an early case, however, it is a different matter. In these cases gastric extract analyses fail to give definite results, as do all other present known methods of examination, except the microscope.

Concerning Roentgen examination, the author says: "It is well to admit that much of the positive information which x-ray examinations give us concerning the function of abnormality of the stomach can be as well obtained by routine clinical examination. In the majority of instances x-ray findings only concern what might be termed accidents in the progress of the disease process." By this the author means such features as stenosis, alterations in shape or position of the viscus with relation to adjacent organs, or deformities in outline. Until such complications occur, Roentgen findings may be entirely negative and the diagnosis must be made clinically or chemically. Concerning the taking of many roentgenograms (from eighteen to forty), the author says: "The perfection of the fluoroscope has rendered this method [roentgenographic plates or films] largely obsolete, tedious, of little added clinical worth, and unnecessarily expensive."

Concerning the significance of gastric ulcer and the so-called "precancerous" history with respect to a subsequent cancer, the author says: "So far as we can judge clinically, a careful development of such history furnishes extremely valuable diagnostic and prognostic information. It would appear from the facts submitted that such interpretation allows the greatest degree of operative benefit with the minimum of operative risk." The surgical treatment of cancer of the stomach naturally relates to complete removal of all the cancerous tissue, and this phase of the subject, including indications and operative technic, is well covered.

On the whole, the book is a well gotten up, thorough exposition of present day knowledge of carcinoma of the stomach.

Medicolegal

Relation of Physician and Patient—Skill Required with Regard to Locality

(Viita vs. Dolan et al. (Minn.), 155 N. W. R. 1077)

The Supreme Court of Minnesota affirms a judgment against defendant Fleming for $2,000 damages for alleged malpractice in the treatment of a fracture of the plaintiff's left leg between the knee and ankle. The court says that defendant Dolan died after this action was commenced. The defendants were partners as physicians and surgeons, and operated a hospital. They had an arrangement with the company in the employ of which the plaintiff was when injured by which the company deducted 75 cents a month from the pay of each employee, and turned this over to the defendants, who agreed for this compensation to care for and treat injured employees which the company should send to them. The plaintiff, after his injury, received a ticket from his employer, presented it to the defendants, and was taken into the hospital and treated. Defendant Dolan attended the plaintiff, who claimed that the failure to get a straight union was due to the omission of the defendants to apply an extension weight to the injured limb. Negligence was also claimed in respect to their failure to use a "fracture box" or to take a roentgenogram for diagnosis. Assuming that the relation of patient and physician existed, the court holds that the evidence was sufficient to justify the jury in finding that the physician failed to exercise toward the patient that degree of care and skill which the law requires. Nor were the damages awarded excessive. The defendants, however, contended that the relation of physician and patient did not exist, under the circumstances stated; but the court holds that it did, and that the defendants owed the plaintiff the duty to exercise ordinary care and skill in treating him. It was true, the court says, that the company, under the terms of the workmen's compensation act, was required to provide medical and surgical treatment to the injured employee during the first ninety days of his disability and to an amount not exceeding $100. But the court is unable to see how this changed the relationship between the injured employee and the physician or surgeon employed, or affected the duty of the latter to the former. Moreover, a settlement between the plaintiff and his employer under the workmen's compensation act, by which the employer was released from all claims on account of the injury to the plaintiff, did not operate as a settlement or release of any claim for malpractice which the plaintiff might have against the physician who treated him. The court thinks it is plainly correct that the locality in which the physician or surgeon practices must be considered in determining whether he has the requisite skill and learning, but the court does not think that he is bound to possess and exercise only that degree of skill and learning possessed by other practitioners in the same locality, if by that is meant the same village or city. If the same general locality is meant, as, for instance, the Northwest, or the state, no fault can be found with such a rule. But in these days the physician or surgeon in a village is not hampered by lack of opportunity for advancement. Frequent meetings of medical societies, articles in the medical journals, books by acknowledged authorities, and extensive experience in hospital work put the country doctor on more equal terms with his city brother. He would probably resent an imputation that he possessed less skill than the average physician or surgeon in the large cities, and this court is unwilling to hold that he is to be judged only by the qualifications that others in the same village or similar villages possess. It was not error to permit questions to the experts in regard to the propriety of taking roentgenograms. While this was not specifically alleged as a charge of negligence, the complaint contained a general allegation of negligent treatment, and the court thinks this evidence was properly received, at least as against the general objection "incompetent, irrelevant and immaterial."

Delay in Discovering Pieces of Glass from Vaginal Douche

(Rogers vs. Voorhees (N. Y.), 157 N. Y. Supp. 330)

The Supreme Court of New York, Appellate Division, First Department, divided three to two, reverses a judgment for $2,628.28 which was entered in favor of the plaintiff, and grants the defendant a new trial. It appeared that the defendant attended the plaintiff during her confinement at a maternity hospital. The dissenting opinion, which gives the more details, says that, accepting the version of the facts which the jury believed, the plaintiff first began to feel intense, sharp pains in her body some ten days after the birth of her child, and told the defendant of her suffering on the very next day, June 26. She had been under his care for some time, and he knew, or should have known, of her general condition, and have been aware of any abnormal change in it. He treated her for the condition which existed after the childbirth, and made an examination before she left the hospital, but could suggest no cause for her suffering, save the failure of the stitches which he had inserted to heal properly. She complained of these pains, and of other conditions, beginning six days after her discharge from the hospital, which was July 7, and repeated the complaints three or four times during July. The defendant was out of the city during August, but when he returned the plaintiff again called on him and complained of her pains and other disturbances. He examined her, but discovered no reason for the condition, and it was not until the early part of December, after many apparent examinations, that the defendant finally made up his mind that there must be some foreign substance in the plaintiff's body apart from the calcareous material which he had thought might be there from the chromicized catgut used in the stitches failing to be entirely absorbed. Then, for the first time, without apparently any further action than the making of his first really careful examination, by the use simply of a probe, which he pressed into a sinus, he found what he thought was calcareous material, which he removed with forceps, and brought out two spears of glass. It was quite apparent that these pieces of glass came from the nozzle of a douche which had been broken within the plaintiff's body during the process of administering hot douches to her by the nurses in the hospital. There was no other explanation of the presence of the glass in her body, as she herself never made use of a glass nozzled douche. Furthermore, when the defendant removed this glass from her body, he gave the two pieces to her and said, "This is outrageous!" and going to a cabinet in his office showed her two douche nozzles, one very thin, the other thicker, and told her that the thin one was a physician's nozzle, which should not have been used except by a physician. As the result of the condition which still existed, the plaintiff was obliged to submit to an operation, December 29, when granular particles of glass were removed from her body. The prevailing opinion says that the only negligence claimed against the defendant was for his delay in making such an examination of the vaginal cavity as would disclose the foreign substance thereafter found. Two experts of standing swore in his behalf that it would have been poor surgery to make such an examination as would disclose the existence of the foreign substance before the time that it was actually made by the defendant. One expert, on behalf of the plaintiff, swore that such an examination ought to have been made three months before it in fact was made. It is always easy, after the cause of an injury has been found, to look back and say that that cause should have been sought for. The jury failed to give proper force to the fact that the defendant had never had the slightest cause of suspicion that any foreign substance could be causing the trouble. The breaking of the glass of a vaginal douche within the vagina is a circumstance so rare as not to have been reasonably contemplated at any time by the defendant, and for failure to anticipate this most unusual occurrence the defendant was most unjustly charged with a substantial money judgment, and, what was worse, with a stain on his professional fidelity.

Society Proceedings

COMING MEETINGS

Montana State Medical Association, Miles City, July 12-13.
Washington State Medical Association, Seattle, July 12-14.

AMERICAN PEDIATRIC SOCIETY

Twenty-Eighth Annual Meeting, held in Washington, D. C., May 8-10, 1916

(Concluded from page 72)

Early Morning Toxic Vomiting in Children

DR. THOMAS S. SOUTHWORTH, New York: I believe this vomiting to be of toxic origin, because the vomitus after the long night period contains no food residue unless a morning feeding has been given. Vomiting from failure of gastric digestion usually occurs later in the day. The cases have neither the characteristic histories nor the clinical symptoms and course of recurrent vomiting, which is another toxic type, in which the toxemia is probably of gradual and cumulative evolution. Elimination is slow and vomiting prolonged. Fever is not constant. In the type under consideration, early morning vomiting, fever is a usual accompaniment, and there is an acute putrefactive process in the intestines, with absorption and attempted reelimination by the gastric mucous membrane. It is thought that this toxic material, accumulating in the stomach during the hours of sleep, when reflexes are deadened, asserts its presence in vomiting on awakening. Purgation results in foul stools, often containing mucus. After the stomach has been emptied by one or two acts of emesis, there is no tendency to recurrence. The extreme caution in resuming feeding often displayed after attacks of the recurrent type frequently leads to undernutrition in children whose attacks occur at rather short intervals. A slightly greater care is demanded in the acute toxic type of intestinal origin.

DISCUSSION

DR. DEWITT H. SHERMAN, New York: A gastric analysis of the material vomited in the early morning might afford an indication as to whether or not there was hyperchlorhydria, and as to the amount of neurotic element in the case.

DR. ISAAC A. ABT, Chicago: I am skeptical as to the gastro-intestinal nature of the vomiting. This occurs in a great many conditions outside the gastro-intestinal tract; for instance, nasopharyngitis.

DR. THOMAS S. SOUTHWORTH, New York: I think it probable that some of the children may have had hyperchlorhydria. In many of these cases there is unquestionably an odor of acetone to the breath; but I have not made examinations of the urine in these cases. If Dr. Abt had seen the case I related, he would have had little doubt that the gastro-intestinal condition was the cause. The symptoms all subsided when the gastro-intestinal tract was cleaned out. The type of cases to which I refer have not had a cough with mucus in the nasopharynx that could have been the cause of the vomiting.

Etiology of Chorea

DR. JOHN LOVETT MORSE, New York: There was nothing in the previous history of the patients seen or in the family history to indicate the presence of syphilis, so we decided that this disease plays no part in the production of chorea. We found no micro-organisms in the spinal fluid, but in the blood we found some. None of these, except the streptococcus, however, would produce lesions in animals. This streptococcus produced the lesions of chorea in rabbits. The organisms found in the blood were different in the different cases. There was a local infection in all the cases in which cocci were found in the blood, so that these organisms might have had no connection with the chorea. The absence of organisms in the cerebrospinal fluid would seem to show that the chorea was not due to an organism. We think that we are justified in concluding that while there is much that points to an organism or a group of organisms as the cause, the bacterial origin of chorea is not proved. The results of

the investigation seem to show that if chorea is caused by a micro-organism, the source of infection is ordinarily in the tonsils or the teeth, and to confirm the belief that there is an intimate connection between rheumatism and endocarditis and chorea.

DISCUSSION

DR. HENRY KOPLIK, New York: I have made a number of blood cultures for syphilis in cases of chorea, with negative results. We have had a number of cases of endocarditis in which chorea came on secondarily, and have had some cases of progressive endocarditis in which we have also found a streptococcus; but that does not mean necessarily that chorea in any of the other cases is of bacterial origin. There may, however, be a bacterial invasion at first, the bacteria disappearing and leaving behind the toxin that causes the symptoms.

DR. I. A. ABT, Chicago: It seems to me that chorea expresses a state of the nervous system that occurs under a variety of circumstances. I collected 225 cases from our hospital records, and the largest number of the patients had had chorea for a definite time without any history of a previous infectious disease that could be connected with chorea.

DR. B. S. VEEDER, St. Louis: I think it is simply a syndrome. We have never been able to get a change in the colloidal reaction, which indicates that it is not a primarily bacterial condition.

DR. JOHN L. MORSE, New York: Thirty-seven per cent. of these children had rheumatism in the past or with the chorea, with acute endocarditis and with valvular lesions. The tonsils were normal in eleven, and had been removed on account of disease in five others. The teeth had been removed in seven, and definite pus pockets were found in three when the teeth were extracted.

Subcutaneous Injections of Magnesium Sulphate in Chorea

DR. HENRY HEIMAN, New York: In five successive cases of chorea, a 25 per cent. sterile solution of magnesium sulphate was used. Three injections were given daily for from ten to fifteen days. The objections to this treatment are the possibility of inflammatory reaction, the fact that very young patients may become unduly excited by the treatment itself, the danger of breaking the needle in the tissues, and albuminuria. We found that the injections did not produce sufficient improvement to justify a further trial.

Familial Icterus in the New-Born

DR. ISAAC A. ABT, Chicago: There seems to be no connection between this disease and chronic family jaundice, in which the patient may experience but little inconvenience and may attain advanced age, although the condition is present at birth. In familial icterus, the children seem to be all right at birth, but must be defective; as the liver soon seems to be unable to perform its extra-uterine function. I have encountered examples in two families. In the first family, of the five children born living, the first two were well and remained so. The third died of the disease on the fourth day, the fourth on the third day, and the fifth child died on the fourth day. In the second family, there were six children. The first two are living and well. The third died of meningitis. The fourth child died of icterus on the third day; and the fifth on the third day. The sixth child was affected and was very ill. It, however, began to improve on the fifth day. It is now a year old and is well. No causes for the disease could be discovered in the history in either family.

DISCUSSION

DR. WILDER TILESTON, New Haven: Yellow staining of the nuclei of the base of the brain and the medulla is never encountered in jaundice in the adult. It indicates a powerful poisoning, because these areas are found to be necrotic. I agree with Dr. Abt that this cannot be a purely septic condition. I should like to ask whether fragility of the red cells has been noted in either the mother or the child in connection with this disease. In chronic family jaundice, this is always present, and there is an excretion of urobilin in the urine, but not in the bile.

Some Observations on Measles

DR. CHARLES HERRMAN, New York: The deaths reported as due to measles give an incorrect idea as to their real number. A large number are caused by a complicating bronchopneumonia, especially between 1 and 2 years of age. This is shown by the parallelism between the curve of morbidity from measles and the curve of mortality from bronchopneumonia between 1 and 2 years. In a study of 300 secondary cases of measles in which the time of infection was definitely known, fever appeared on the tenth or eleventh day in 56 per cent.; the catarrh on the eleventh or twelfth day in 50 per cent., and the tonsillar spots on the ninth to the thirteenth day. The Koplik spots were seen on the eleventh or twelfth day in 54 per cent. The catarrh was present in only 7.2 per cent. on or before the tenth day; the Koplik spots, in 12.3 per cent., and tonsillar spots in 34 per cent. In some patients, the tonsillar spots were present as early as the seventh day. They were occasionally noted in patients who did not show Koplik spots. Infants under 2 months are absolutely immune. This immunity gradually disappears, and is entirely absent at eight months. In infants between 5 and 8 months, the period of incubation is usually longer, the infection is milder, and they lose less weight. The immunity is probably conveyed through the placental circulation. Infants between 3 and 5 months who are brought into intimate contact with measles and do not contract the disease are frequently not infected when exposed in later life.

DISCUSSION

DR. HENRY KOPLIK, New York: At the very outset, sometimes five days before the eruption, there is a febrile movement; and with it, the first appearance of the Koplik phenomenon. We isolate these children, and then wait patiently until the eruption comes out.

Meningitis in the New-Born and in Infants Below Three Months of Age

DR. HENRY KOPLIK, New York: Many authors assume that meningitis is always secondary to general sepsis in the new-born, but in many instances it is a primary infection. It is difficult to diagnose, because the signs that we apply later are inadequate to apply to these new-born children. We can, however, find some characteristic symptoms. First are convulsions, which are usually accompanied by fever, often very high. It is only after a week or ten days that there is an increase in the quantity of fluid, which, on lumbar puncture, may show various organisms. The disease is not always caused by the meningococcus. All the cases seem to be fatal, sooner or later. Only one of my twelve patients is alive, a child with hydrocephalus. The results of washing out the ventricle through the lumbar puncture have not been encouraging. How does a new-born baby get meningitis? If you stop to think of some of the methods used in resuscitating infants in some of our hospitals, you can well understand how mouth suction, etc., may afford an avenue of infection with the meningococcus.

DISCUSSION

DR. D. J. MILLER, Atlantic City, N. J.: I had a case of meningococcus meningitis in almost a new-born baby, whose first symptom was an attack of conjunctivitis, which was erroneously diagnosed as of gonococcal origin. The material obtained by lumbar puncture was gelatinous and almost sterile; but later I made a ventricular puncture and found the meningococcus. The child died. The blood was sterile.

DR. CHARLES HERRMAN, New York: The case which I reported last year was unusual, because the child did not even have one convulsion. This indicates that cases of meningitis in very early life may not be so rare as the few reports would lead us to believe. In some cases the organism causing the disease is the colon bacillus.

DR. J. H. M. KNOX, Baltimore: I reported a case in which a child only a year old, with beginning hydrocephalus, was found with slightly turbid cerebrospinal fluid containing the meningococcus. There was only a very indefinite history of meningitis in the case.

DR. I. A. ABT, Chicago: Is there any difficulty in differentiating between meningitis and meningeal hemorrhage in the new-born, cerebral abscess, or sinus thrombosis? Is there any difficulty in hospitals in making lumbar puncture in the case of new-born babies?

DR. L. E. LA FETRA, New York: Meningitis is frequent as a part of general sepsis in infancy, without the symptoms of meningitis. If we had necropsies and did lumbar punctures more frequently, I think we should find more cases. The meningitis often exists a long time before it is discovered, but we had an interesting case in which pus containing meningococci was known to have developed in the cord within two days.

DR. HENRY KOPLIK, New York: I know nothing about the minutiæ of bacteriology, but go by the report of the bacteriologist. When there is a slight rise of temperature in the new-born, there is considerable difficulty in differentiating between meningitis and ordinary meningeal hemorrhage. Otitis is quite common as a secondary infection in new-born babies, but I know nothing about sinus thrombosis in them. The difficulty of lumbar puncture is not great.

Use of Salt Solution By the Bowel in Infants and Children

DR. EDWIN E. GRAHAM, Philadelphia: My experience leads me to consider this method as of more value than is usually thought. I have used it in pylorospasm with gratifying results. It has also been of use in erysipelas and typhus fever. Feeding children who cannot retain nourishment by mouth in this manner has resulted in their retaining the nutriment enemas, if given slowly. Isotonic serum may be given by proctoclysis better than by subcutaneous injection. The fluid should trickle into the rectum at the rate of half a pint an hour, at a temperature of from 98 to 100 F. The flow should be checked for an hour every second hour, to give the bowel a rest. When slight edema of the tissue is noted, the giving of the fluid should be stopped until this disappears. The treatment can usually be continued from four to six days, and it may sometimes be kept up, with interruptions, for ten days or two weeks.

DISCUSSION

DR. T. H. MCCLANAHAN, Omaha: Infants from 2 to 6 days old often suffer from high temperature and anuria, and this is called inanition fever. In other cases, such as those of harelip and cleft palate, the baby cannot create suction, and sometimes starves on this account. I have seen a case in which breast milk was pumped from the breast of the mother and introduced into the stomach of the child, saving its life.

DR. I. A. ABT, Chicago: I have never had a great deal of success in keeping the tube in place. Very frequently one sees considerable irritation around it. We are simply inverting the natural process by giving the baby water to drink by the rectum, and I should think that it would cause the infant an increased amount of labor that might decide against it in its fight for life.

DR. L. E. LA FETRA, New York: We found it best to use a vacuum bottle, inverted, for keeping the solution warm. It is better to put the water in by some other way than the rectum, if this is possible.

DR. EDWIN E. GRAHAM, Philadelphia: There are quite a large number of children in whom it is impossible to introduce fluid by the mouth and stomach. My cases were of this sort, and I naturally chose the rectum instead.

The Energy Metabolism of a Cretin

DR. FRITZ B. TALBOT, Boston: A typical cretin, aged 3 years and 8 months, was studied in the Benedict respiratory chamber of the Massachusetts General Hospital. It was found that when he was quiet, he produced, respectively, 39 and 42 calories per kilogram of body weight, which is relatively much lower than the amount of calories produced per kilogram of body weight by two normal babies, aged 8½ and 10 months. His metabolism, estimated on the basis of body surface (Lissauer), was also relatively lower. This is consistent with the findings of Du Bois in his cretin, aged 36 years.

The Dangers From Carriers of Diphtheria to Hospital Efficiency

DRS. SAMUEL S. ADAMS and FRANK LEECH, Washington, D. C.: One of the dangers that menace hospital efficiency is the diphtheria carrier. The efficiency of our hospital has lately been greatly crippled from this cause. Our wards were closed to new patients for three weeks, and one ward is still closed. The original source of infection was a child admitted for lobar pneumonia. A nurse complained of sore throat, but was not off duty. She associated with the other nurses and with her patients. The baby ward gave the greatest trouble, and eight nurses distributed through the other wards gave cultures, spreading the disease among the patients there. Cultures were made after the discovery of the first cases, but before the epidemic could be stopped forty children and one physician, besides the nurses and hospital employees, were affected.

THE AMERICAN ASSOCIATION OF IMMUNOLOGISTS

Third Annual Meeting, held in Washington, D. C., May 11-12, 1916

(*Continued from page 70*)

Immunity Results Obtained From the Use of Diphtheria Toxin-Antitoxin Mixtures and the Use of the Schick Test

DRS. WILLIAM H. PARK and ABRAHAM ZINGHER, New York: It is advisable to immunize children soon after the first year of life, so as to afford them a protection against diphtheria at a time when the disease is most dangerous. In addition, such young children, by not having any hypersensitiveness to the bacillus protein, show very mild local and constitutional symptoms after the injections. An immune child population could thus be developed with the result that fresh clinical cases would be prevented and the bacillus carrier would probably soon disappear as a hygienic factor in our communities. The use of the Schick test in the selection of susceptible children for immunization and in controlling the results of the treatment is justified by the great clinical accuracy which the test has shown during a period of several years in the separation of the susceptible from the immune individuals. The test should be carried out properly with a fresh toxin solution, and the results read daily, for a period of from seventy-two to ninety-six hours. The pseudoreactions should be controlled with heated toxin, or recognized by their rapid disappearance after seventy-two hours. It is only these individuals who give the more marked local reactions after the injections of toxin-antitoxin.

Epidemiology of Lobar Pneumonia

DR. A. R. DOCHEZ, New York: Examination of normal individuals showed that the two types of pneumococcus responsible for the majority of the severe cases of lobar pneumonia are not found in the normal healthy mouth, except in such instances as when the individual harboring the organism has been in intimate association with a case of lobar pneumonia. When such a condition exists the organism found in the normal mouth invariably corresponds in type to that found in the lung of the diseased individual. These studies make it probable that the majority of cases of pneumonia are dependent on either direct or indirect contact with a previous case.

DISCUSSION

DR. EDWARD B. VEDDER, Washington, D. C.: We learned a long time ago that many normal individuals carried the pneumococcus in their sputum. Now, Dr. Dochez and his associates tell us that this is wrong. In any case prevention is more important than cure. It means that every case of pneumonia may be traced to a previous case. This means that from a sanitary point of view every case of pneumonia must be treated just like any other infectious disease in which the infecting agent is transmitted by the buccal secretions of those affected, and the present widespread prevalence of pneumonia is probably due to our policy of *laissez faire*. Boards of health should demand: 1. Notification of

all cases of pneumonia. 2. Prompt visitation by a health officer, collection of specimens and laboratory diagnosis of the type of organism present in the patient and in the contacts. 3. Isolation of the patient and of any contacts who harbor the type of pneumococcus found in the patient. 4. A negative culture requirement before the patient or carriers are permitted to mingle with the community.

DR. E. C. L. MILLER, Richmond, Va.: Dr. Frederick Hanes of Richmond has been doing some work with pneumonia along these lines. He has kept mice and diagnostic serums on hand and has treated some patients with the curative serums. However valuable this work may be from an experimental standpoint, it is evidently not practical. It can be done only by an expert.

DR. JOSEPH HEAD, Philadelphia: Obviously only a small percentage of the germs that are introduced into the mouth find lodgment within the tissues and become pathogenic. In making my bacterial examinations for autogenous vaccines, I cauterize the surface of the infected spot with an electric cautery until it turns slightly white, and then extract blood from the tissues through the cauterized spot with a hot platinum spear. Out of 400 such examinations I found streptococci in 95 per cent., the influenza bacillus and the *Micrococcus catarrhalis* in about 75 per cent., while the pneumococcus appeared in about 25 per cent.

Studies in Typhoid Fever

DR. A. L. GARBAT, New York: A positive complement fixation test after prophylactic typhoid immunization is not a regular occurrence, as it is during or after typhoid fever. This point may be of aid in deciding for or against the diagnosis of typhoid fever in an inoculated individual still having a positive Widal and ill with a suspicious typhoid and negative blood culture. A positive complement fixation test was obtained most often after three injections with a polyvalent vaccine; two injections with the same vaccine or three injections with the single strain vaccine (Rawlings) gave hardly any complement fixation. Cultures of the duodenal contents (bile) removed by means of the duodenal tube seem to be a more reliable and simpler method for the detection of typhoid bacilli than stool examinations. The serum from convalescent typhoid patients has been employed with distinct benefit in three very severe acute typhoid cases.

DISCUSSION

DR. A. H. SINCLAIR, Honolulu, H. I.: I do not believe that any patient who gives a positive Widal after typhoid could again contract the disease.

DR. ABRAHAM ZINGHER, New York: With intramuscular injections of fresh whole blood, obtained from convalescent scarlet fever patients, either citrated or noncitrated, distinctly beneficial effects were noted in toxic cases after injections of blood obtained from patients who were three or four weeks' convalescent. Very striking improvement was seen from 500 c.c. of fresh blood obtained from a three months' convalescent donor. I have used intramuscular injections of normal blood in late septic cases of scarlet fever. In these the toxemia of scarlet fever was no more in evidence. Injections of normal blood are given in quantities of from 120 to 240 c.c., and repeated every four days. Such blood is not given for any specific action but for its general stimulating and nutritive value, which helps in tiding the patient over a critical period.

Prophylactic and Therapeutic Inoculations in Certain Affections of the Respiratory Tract

DRS. GEORGE W. ROSS, H. K. DETWEILER, and J. C. MAYNARD, Toronto: In connection with the recent epidemic in Toronto, it was shown that the *Streptococcus pyogenes* largely prevailed in cultures from the nose, nasopharynx and sputum. The duties of a battalion of soldiers quartered there were greatly interfered with because of this epidemic cold. We prepared vaccines from many strains of different organisms isolated. Sixty-two soldiers received from one to six inoculations, and we were strongly impressed by the results obtained.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

June, LXXIII, No. 6, pp. 997-1192

1 Pregnancy in Tuberculous; Report of Sixty-Eight Cases. C. C. Norris, Philadelphia.
2 Operating During Puerperium for Cure of Old Lacerations of Cervix and Perineum. A. A. Hussey, Brooklyn.
3 Management of Ovarian Tumors Complicating Pregnancy, Labor and Puerperium. R. M. Beach, Brooklyn.
4 Lipoid Content of Maternal and Fetal Blood. A. Hymanson and M. Kahn, New York.
5 Postmortem Cesarean Section; Report of Ten Cases. J. A. Harrar, New York.
6 Legal Aspects of Postmortem Cesarean Section. G. W. Whiteside, New York.
7 End Results in Cases Operated for Salpingitis. E. MacD. Stanton, Schenectady.
8 Posterior Dislocation of Lower Humeral Epiphysis as Birth Injury. E. D. Truesdell, New York.
9 Case of Osteomalacia. H. Bailey, New York.
10 Palpation of Ureters Per Vaginam. A. M. Judd, Brooklyn.
11 Case of Congenital Amputation (?) of Fingers. T. Abbe, Washington, D. C.
12 Spinal Anesthesia. F. H. Knight, Brooklyn.
13 Fibro-Adenorhabdomyomatous Mesothelioma of Kidney. R. A. Keilty, Philadelphia.

Archives of Internal Medicine, Chicago

June, Part I, XVII, No. 6, pp. 711-854

14 *Study of Salt, Nitrogen and Water Excretion in Nephritis. J. P. O'Hare, Boston.
15 *Experimental Hypercholesterolemia. K. Dewey, Chicago.
16 *Pharmacologic and Clinical Study of Papaverin. D. I. Macht, Baltimore.
17 Clinical Hemoglobinometer. H. Haessler and H. S. Newcomer, Philadelphia.
18 *Use of "Karell Cure" in Treatment of Cardiac, Renal and Hepatic Dropsies. E. H. Goodman, Philadelphia.
19 *Reaction of Cerebrospinal Fluid. S. H. Hurwitz and C. L. Tranter, San Francisco.
20 Method for Determination of Alkali Reserve of Blood Plasma. W. McK. Marriott, Baltimore.

June, Part II, No. 6, pp. 855-1059

21 Clinical Calorimetry. Further Measurements of Surface Area of Adults and Children. M. Sawyer, Iowa City, Ia.; R. H. Stone and E. F. Du Bois, New York.
22 Id. Formula to Estimate Approximate Surface Area if Height and Weight Be Known. D. Du Bois, Burlington, Vt., and E. F. Du Bois, New York.
23 *Id. Comparison of Metabolism of Men Flat in Bed and Sitting in Steamer Chair. G. F. Soderstrom, A. L. Meyer and E. F. Du Bois, New York.
24 *Id. Metabolism of Boys Twelve and Thirteen Years Old Compared with Metabolism at Other Ages. E. F. Du Bois, New York.
25 Id. Basal Metabolism of Normal Adults With Special Reference to Surface Area. F. C. Gephart and E. F. Du Bois, New York.
26 *Id. Metabolism in Exophthalmic Goiter. E. F. Du Bois, New York.
27 *Id. Basal Metabolism in Pernicious Anemia. A. L. Meyer and E. F. Du Bois, New York.
28 *Id. Basal Metabolism of Patients With Cardiac and Renal Disease. F. W. Peabody, Boston, A. L. Meyer and E. F. Du Bois, New York.
29 *Id. Metabolism and Treatment in Diabetes. F. M. Allen and E. F. Du Bois, New York.

14. Study of Salt, Nitrogen and Water Excretion in Nephritis.—Several methods have been proposed for the study of salt and nitrogen excretion in chronic nephritis. In one method, with the patient on a standard diet, the elimination of an added amount of salt and nitrogen is followed for several days; in another, the salt and nitrogen excretion is quantitated for one day in two-hour urine specimens with the patient on several standard meals of varying composition. A third way is to quantitate salt and nitrogen in the blood and urine and express their relations by a formula giving an index of excretion. In thirty cases the first two tests have been carried out by O'Hare along with other tests of renal function. He found that in general, salt excretion is impaired before there is much disturbance of water and nitrogen excretion; in most patients salt and water excretion behave very similarly; the nitrogen excretion is greatly impaired usually only in the severe cases. Salt, water and

nitrogen excretion show some disturbance in even the very mild cases in which phenolsulphonephthalein excretion is normal, and there is no increased blood nitrogen. These dietary tests can not be used in all cases of chronic nephritis. They cannot be carried out in those that are very severe. The methods involving the determinations of the indices of excretion of urea and salt do not have a number of the difficulties met with in carrying out the dietary tests. These indices were determined in fifteen cases in which both dietary tests were carried out, and the indices seemed to give as much information as the other tests and to possess distinct advantages inasmuch as they can be determined for practically every patient and require considerably less time and less labor in their execution. According to the author the great advantage of all three of these tests is that they give information as to disturbed renal function in those mild cases in which phenolsulphonephthalein excretion is normal and the blood urea-nitrogen is not increased.

15. **Experimental Hypercholesterolemia.**—As a result of hypercholesterolemia Dewey states that gallstones may be formed in sterile bile without infection or injury of the gallbladder. Their formation is preceded by desquamation of the epithelial cells, due to the irritating action of an excess of cholesterol. Cholesterol injected into the circulation of rabbits is not accumulated in the blood to any large degree, but is rapidly deposited in various organs, while the elimination of it through the bile and urine is also greatly increased. The focal infiltration of the kidney with cholesterol which occurs in hypercholesterolemia is accompanied by degenerative processes of the parenchymatous structures. The urine, as a rule, contains appreciable amounts of cholesterol.

16. **Pharmacologic and Clinical Study of Papaverin.**—The alkaloid papaverin Macht found exhibits certain very interesting pharmacologic properties. Chief among these are its effect on the heart and blood pressure, its action on the coronary circulation, its stimulating effect on the respiration, its relaxing and tonus-lowering influence on the smooth muscle structures, and its considerable analgesic power. These, together with its comparatively low toxicity, suggested its employment for therapeutic purposes. The clinical experiences described speak in its favor, and Macht suggests that further observations be made to determine its exact therapeutic value in medicine.

18. **Use of "Karell Cure" in Treatment of Dropsies.**—The diet which has served Goodman best and which he has employed successfully for some time is that known as the Karell diet, or the Karell cure. The technic of the Karell cure is simple and easily carried out. The patient receives daily at 8 a. m., 12 m., 4 p. m., and 8 p. m. 200 c.c. of raw or boiled milk, warm or cold, according to taste. No other food or liquid should be given. This strict diet many times meets with violent opposition from the patient, and great complaint is made because of thirst. Thirst is particularly tormenting during the first three or four days of the "cure," and often it becomes necessary to allow the patient to rinse out his mouth with water, instructing him to swallow none, however. Hunger is not so common a complaint, but when urgent, a small piece of dry toast or zwieback may be given with each portion of milk. During the first few days the patient requires continual encouragement to persist with the treatment, but the moral effect of the rapid loss of weight, as shown by daily weighings, together with the very evident decrease of the edema, prove sufficient argument to him, and no further complaint is heard. Just how long this very strict diet is to be continued depends on the rapidity with which edema diminishes and on the patient's plea for more food. Usually the diet may be increased at the end of a week's time by giving a soft-boiled egg, without salt or pepper, at 10 a. m., and a piece of zwieback at 6 p. m. The next day an egg may be given at 10 a. m. and at 2 p. m., with a piece of white bread, and from now on food is gradually increased until a full diet is being taken. During this time the daily quantum of liquid should not exceed 800 c.c., and this fluid should be in the form of milk, until the patient receives a full diet, when the milk may be discontinued and cocoa or tea substituted, the amount of liquid remaining the same, however. No more than 800 c.c. of fluid should be taken for from two to four weeks after the disappearance of edema. During the "cure," which must be carried out with the patient in bed, the bowels must be kept open, and for this purpose laxatives in pill form are preferable to salines, merely because they require no water for their administration. In a typical case, that is, in those individuals who begin to lose weight through the loss of edema, and who show increased diuresis, no other medication is required, but in cases in which improvement is not seen at the end of three days, or when symptoms are urgent, such as dyspnea, oppression, restlessness, unduly frequent and weak pulse, or active uremic signs, the drugs and other measures usually indicated in such conditions should be used.

19. **Reaction of Cerebrospinal Fluid.**—The colorimetric method of determining the hydrogen ion concentration of the cerebrospinal fluid is recommended by Hurwitz and Tranter because it gives constant and reliable results. The method, when applied to cerebrospinal fluid, possesses greater accuracy than in the case of other biologic fluids, notably blood. The simplicity of the technic makes it applicable as a routine procedure in the examination of spinal fluids. As determined colorimetrically, normal cerebrospinal fluid is more alkaline than blood, the difference in the hydrogen ion concentration of the dialysates of the two fluids being equal to 0.45, the value of pH for cerebrospinal fluid being 8.11; value of pH for blood, 7.66. No alteration from the normal reaction has been noted either in the blood or in the fluid of patients suffering from primary or secondary syphilis or from syphilitic affections of the nervous system. Thus far no study has been made of the reaction of the cerebrospinal fluid in acute inflammatory conditions of the meninges. The demonstration that a change in reaction does or does not occur would have an important bearing on the value of hexamethylenamin as a therapeutic agent in the prophylaxis and treatment of meningeal infections.

23. **Comparison of Metabolism of Men Flat in Bed and Sitting in Steamer Chair.**—Four normal men and two cardiac patients were studied by the authors in the calorimeter lying flat in bed and in the semireclining position propped up with a back rest, or else in a comfortable steamer chair. A total of twenty-one experiments showed that the metabolism averaged 3 per cent. lower in the semireclining posture. One of the cardiacs, and possibly one of the normal controls, showed a slightly higher metabolism when propped up in bed. The difference between the results is so small that in the study of pathologic cases the authors can use the same figures for the average normal metabolism in both postures. In the majority of cases, however, the energy requirement is lower in the orthopneic position.

24. **Metabolism of Boys of Twelve and Thirteen Compared with Metabolism at Other Ages.**—Eight normal boys, 12 or 13 years old, were studied by Du Bois in the respiration calorimeter four to six hours after a small breakfast. They were allowed to read for one of the two experimental hours, but were very quiet. The methods of direct and indirect calorimetry agreed within 0.04 per cent. Their heat production per unit of surface area was 32 per cent. higher than the adult level according to Meeh's formula, or 25 per cent. higher according to the more accurate "Linear Formula." In studying the effect of growth on metabolism, interpretation of the results obtained on infants is complicated by the fact that babies differ greatly from adults in the proportions of the body and the relative size of the viscera, notably the liver and thyroid. Boys just before the onset of puberty have almost adult proportions. They are in the midst of a period of accelerated growth. The fact that the metabolism is high, points to a specific increase in the metabolism of the growing organism.

26. **Metabolism in Exophthalmic Goiter.**—The metabolism in exophthalmic goiter has been studied for the first time by Du Bois in a respiration apparatus which is also a calorimeter. Thirty-seven observations were made on eleven patients with this disease, and six experiments were made on a cretin. With some of the patients the nitrogen balance was also studied. The measurement of the heat production

gives the best index of the severity of the disease and of the effect of treatment. Very severe cases show an increase of 75 per cent. or more above the normal average, severe cases 50 per cent. or more, and moderately severe and mild cases less than 50 per cent., while a few mild and several atypical or cases in which operation has been performed may be within normal limits. In severe cases the warmth of skin and sweating can be accounted for entirely by the necessity for the increased elimination of heat. At least a part of the tachycardia is due to the increased metabolism, and perhaps it might be possible to reproduce the extreme tachycardia, the cardiac enlargement, emaciation and mental irritability if it were possible to stimulate the metabolism of normal men for twenty-four hours a day over a period of months or years. The specific dynamic action of protein and of glucose is within normal limits, and there is no consistent difference between the effects of protein in meat and an equal amount in milk and eggs. One patient was able to derive 89 per cent. of his calories from carbohydrate in an experiment when he was showing an alimentary glycosuria. The average water elimination through skin and lungs in the severe and moderately severe cases of hyperthyroidism is 39.9 gm. per hour. The increase above the normal is closely proportional to the increase in heat production; 25.7 per cent. of the calories are dissipated through vaporization in goiter patients, whereas the mean normal is almost the same, 23.9 per cent. The level of the heat production was used as an index of the effect of medical treatment. Rest in bed for a week or more caused a drop of more than 10 per cent. The effects of treatment with Beebe's serum, thyroid "residue," ergotin and quinin hydrobromate was less marked, each being tested on one patient. Ligation of the thyroid arteries with three out of the four patients studied caused a distinct rise in metabolism, the duration of which was uncertain. There is as yet no proof that any conservative form of treatment causes a greater reduction of metabolism than mental and physical rest.

27. **Basal Metabolism in Pernicious Anemia.**—Three mild cases of pernicious anemia showed very slight increase in the metabolism. In two severe cases the demand for oxygen was from 7 to 33 per cent. above the normal average. The basal metabolism of pernicious anemia is lower than that of leukemia, but, as a rule, higher than that of secondary anemia. The agreement between the direct and indirect calorimetry as well as the respiratory quotients indicates that the basal metabolism of pernicious anemia is qualitatively identical with the normal. Although the demand for oxygen may be increased, the compensatory processes in uncomplicated cases of pernicious anemia are capable of meeting the demand in spite of a greatly diminished hemoglobin content. There is some ground for the belief that the height of metabolism is a measure of the severity of the clinical pictures.

28. **Basal Metabolism of Patients with Cardiac and Renal Disease.**—Sixteen patients with cardiac and cardiorenal disease were studied by the author. The respiratory quotient in all cases was within normal limits (0.73 or above). Patients with compensated cardiac lesions or with mild nephritis showed no increase in the metabolism. Of twelve patients with dyspnea, nine showed a distinct rise in metabolism, and in five of these the increase was from 25 to 50 per cent. above the average normal. Two out of the five gave evidence of marked acidosis in the low content of carbon dioxid in the alveolar air. In two others, whose metabolism was just as high, there was no significant depression of the alveolar carbon dioxid.

29. **Metabolism and Treatment in Diabetes.**—Three patients with severe diabetes and three with moderate or mild diabetes were studied by Allen and Du Bois in the respiration calorimeter. The effects of the oatmeal treatment and the fasting treatment were followed in detail. No special influence of oatmeal in diabetes or special readiness of oxidation of this form of carbohydrate was demonstrable in these experiments. The occurrence of "total" diabetes in human patients, with dextrose-nitrogen ratios approximating 3.65 to 1 and corresponding respiratory quotients, is shown. Notwithstanding the extreme severity, neither the sugar excretion nor the gaseous exchange gives ground for assuming the formation of sugar from fat in any instance. Even in the severest type of diabetes the active symptoms may be eliminated completely by prolonged fasting. The observations in the respiration calorimeter prove that patients as a result of the fasting acquire the power of oxidizing sugar derived first from their own body protein and later from the protein and carbohydrate of a carefully regulated diet. The respiratory quotients during fasting and after the glycosuria had ceased were in some such instances higher than can easily be explained by the oxidation of the materials supposedly available. Also the ingestion of alcohol was sometimes followed by respiratory quotients higher than would theoretically be expected. The specific dynamic action of food, especially fat, was apparently normal in a patient with moderately severe diabetes. The results of two respiration experiments in a severely diabetic patient have shown that mild exercise slightly raises the quotient, and this suggests the possibility that exercise may improve carbohydrate utilization. Generalizations or positive conclusions from these experiments are not attempted.

Boston Medical and Surgical Journal

June 22, CLXXIV, No. 25, pp. 891-924

30 Movements in Medicine. D. L. Edsall, Boston.
31 Respiratory Exchange, Respiration Apparatus for Clinical Use. (To be concluded.) F. G. Benedict and E. H. Tompkins, Boston.
32 Cholecystostomy vs. Cholecystectomy. F. B. Lund, Boston.
33 Case of Sacro-Iliac Strain Following Symphysiotomy. C. F. Painter, Boston.

Bulletin of Johns Hopkins Hospital, Baltimore

June, XXVII, No. 304, pp. 157-192

34 *Thorium for Pyelography. J. E. Burns, Baltimore.
35 *Statistical Study of Six Hundred and Thirty-Five Labors With Occiput Posterior. E. D. Plass, Baltimore.
36 Letter of Edward Jenner Containing Brief Account of His Discovery of Vaccination. C. M. McBryde, Washington, D. C.
37 Sixty-Four Cases of Epilepsy in Patients From Fourteen Years to Forty Years of Age. L. R. Waters, Baltimore.
38 Severe Anemia With Eosinophilia. A. F. Beifeld and M. E. Barnes, Chicago.
39 Possible Rôle of Books in Dissemination of Contagious Diseases. C. A. Laubach, Baltimore.

34. **Thorium for Pyelography.**—Burns is emphatically of the opinion that thorium solution fulfils all the conditions necessary for an ideal pyelographic medium. Clinically, there has never been the slightest evidence of toxicity in a series of 125 cases, the amounts used in a single case varying from a few cubic centimeters to almost a liter. This alone, Burns says, is proof of its nontoxicity. Experimentally, although in a few instances death has followed the injection of large doses into the peritoneal cavity and tissues of animals, larger doses intraperitoneally and intravenously have produced no ill effects. That the solution is nonirritating is shown by the absence of urinary symptoms after its use, and the absolute lack of any such evidence cystoscopically, and at operation. The pyelograms and cystograms made with this solution show a splendid shadow which possesses an unusual clearness of delineation. The solution is clear and watery, therefore it possesses a great degree of fluidity, permitting its ready elimination from the urinary tract. It is perfectly clean and does not stain the linen. In this particular it possesses another marked advantage over other solutions, particularly those of the silver salts. It is quite inexpensive, being about one third as costly as collargol.

35. **Occiput Posterior in Labor.**—Plass analyzed 5,770 cases, representing 5,801 children. There were 635 cases of occiput posterior among 5,488 vertex presentations, an incidence of 11.57 per cent. (right 7.96 per cent., left 3.3 per cent.). These figures are considerably lower than those usually given. The discrepancy is explained by the fact that the majority of the patients applied for admission only when labor was well advanced, and after a certain amount of internal rotation had taken place. Rotation of the occiput into the hollow of the sacrum occurred in 14 per cent. of the cases. Premature rupture of the membranes was not especially frequent when the occiput was posterior. Spon-

taneous delivery was the usual outcome. The total operative incidence was 22.9 per cent., but in only 11.02 per cent. was the position possibly accountable for the need for intervention. There was no increased infant mortality because of the posterior position. Labor was not prolonged, independently of whether the occiput rotated to the symphysis or into the hollow of the sacrum. A contracted pelvis did not increase the incidence of the posterior positions. There was no additional maternal morbidity or mortality.

Colorado Medicine, Denver

June, XIII, No. 6, pp. 167-198

40 Surgical After-Treatment. W. W. Grant, Denver.
41 *Use of Heat in Control of Inoperable Cancer. C. E. Tennant, Denver.
42 Deep Roentgen Therapy of Benign and Inoperable Malignant Conditions by Improved Technic. L. G. Crosby, Denver.
43 Intratracheal Insufflation of Ether. K. F. Roehrig, Denver.
44 Traumatic Rupture of Pancreas; Report of Case. C. B. Dyde, Greeley.

41. **Heat in Inoperable Cancer.**—Experiments made on large masses of beef led Tennant to believe that the d'Arsonval current is a very potent and serviceable means of obtaining the same or even better results than by Percy's method in tumor masses located in some of the more inaccessible portions of the body. In every test made, the d'Arsonval current raised the average temperature of a given mass 24 F. higher than the Percy cautery irons did, in just one half the time consumed by the latter.

Georgia Medical Association Journal, Augusta

June, VI, No. 2, pp. 17-39

45 By Example as Well as by Precept. E. R. Park, Atlanta.
46 Plea for Regulating Advertising and Sale of Patent Medicines. L. O. Elrod, Forsyth.
47 How We Expect Ellis Public Health Bill to Benefit Floyd County. M. M. McCord, Rome.
48 Management of Diphtheria Epidemics. E. E. Murphey, Augusta.
49 Diagnosis of Gastric Ulcer and Carcinoma by Roentgen Ray. W. A. Cole, Savannah.

Illinois Medical Journal, Chicago

June, XXIX, No. 6, pp. 401-472

50 Physician and Public Health. C. W. Lillie, East St. Louis.
51 Medical Mechanism for War in United States. W. B. Banister, Chicago.
52 Recurrence of Symptoms After Operation for Gallstone Disease. J. B. Deaver, Philadelphia.
53 Study of Physiomechanical Function of Faucial Tonsil. E. L. Kenyon and W. T. Kradwell, Chicago.
54 Military Surgery—What Is it? G. M. Blech, Chicago.
55 Toxic Delirium and Its Management. H. D. Singer, Kankakee.
56 Diagnosis of Sterility. V. D. Lespinasse, Chicago.
57 Schick Reaction, Its Practical Value. A. Sprenger, Peoria.
58 Diagnosis and Treatment of Tuberculosis of Third Cervical Vertebra. J. Ridlon, Chicago.
59 Treatment of Obesity by Electrotherapy. E. A. Miller, Chicago.

Journal of Abnormal Psychology, Boston

April-May, XI, No. 1, pp. 1-72

60 Subconscious Settings of Ideas in Relation to Pathology of Psychoneuroses. M. Prince.
61 Obsessions of Normal Minds. C. S. Berry, Ann Arbor, Mich.
62 Psychopathology of Everyday Life. M. Solomon, Chicago.
63 Apparent Inversion of Time in Dreams. L. H. Horton.

Journal of Biological Chemistry, Baltimore

June, XXV, No. 2, pp. 177-350

64 Quantitative Determination of Total Protein and Nonprotein Substances of Muscle. N. W. Janney, New York.
65 Protein Content of Muscle. N. W. Janney, New York.
66 Partition of Phosphorus in Thymus Nucleic Acid. H. C. Germann, Baltimore.
67 Determination of Creatin in Muscle. L. Baumann and T. Ingvaldsen, Iowa City, Iowa.
68 Is Autolysis an Autocatalytic Phenomenon? H. C. Bradley, Madison, Wis.
69 *New Salt (Zinc Urate) of Uric Acid and Its Application to Analysis of Uric Acid and Phenol. J. L. Morris, St. Louis.
70 Chemical and Physical Analysis of Blood in Thirty Normal Cases. A. O. Gettler and W. Baker, New York.
71 Tetany of Parathyroidectomized Dogs. I. Greenwald, New York.
72 Formation of Specific Proteoclastic Ferments in Response to Introduction of Placenta. F. Hulton, Philadelphia.
73 Colorimetric Method for Estimation of Free Formaldehyd and Hexamethylenamin. R. J. Collins and P. J. Hanzlik, Cleveland.
74 Nutritive Deficiencies of Wheat and Grain Mixtures and Pathologic Conditions Produced in Swine by Their Use. E. B. Hart, W. S. Miller and E. V. McCollum, Madison, Wis.
75 Studies of Autolysis. Effect of Reaction on Liver Autolysis. H. C. Bradley and J. Taylor, Madison, Wis.
76 Studies in Bence-Jones Proteinuria. A. E. Taylor and C. W. Miller, Philadelphia.
77 Urease Content of Certain Beans, With Special Reference to Jack Bean. J. G. Mateer and E. K. Marshall, Jr., Baltimore.
78 *Nutrition Investigations on Cottonseed Meal. A. E. Richardson and H. S. Green, Austin, Texas.
79 Ninhydrin Reaction With Amino-Acids and Ammonium Salts. V. J. Harding and F. H. S. Warneford, Montreal.
80 Ninhydrin Reaction With Amins and Amids. V. J. Harding and R. M. MacLean, Montreal.

69. **New Salt (Zinc Urate) of Uric Acid.**—Since the separation of the zinc urate is very complete and practically instantaneous even from solutions of low concentration of uric acid, and room temperature serves equally as well as higher temperatures, it has seemed probable to Morris that the precipitation may prove useful in determining uric acid in urine and blood. This is now being investigated by him.

70. **Analysis of Human Blood.**—The blood of thirty normal individuals (males and females of ages ranging from 17 to 60) was analyzed by Gettler and Baker for the various chemical constituents and physical constants, using the modern micromethods, thus giving a fairly complete picture of blood in health. Twenty-eight determinations were made on each sample, requiring in all only 70 c.c. of blood. Among the values found, the following are especially mentioned: (*a*) the values for nonprotein nitrogen tend toward a higher level (30 to 45 mg.) than those given by previous workers; (*b*) the normal range of urea nitrogen should also be considered higher (15 to 25 mg.) than previously reported by many workers; (*c*) uric acid may reach as high as 3.0 mg. in 100 c.c. of blood in many normal individuals; (*d*) surprisingly low figures were consistently obtained for creatin (0.1 mg. or less in 100 c.c. of blood). Any value above 1.0 mg. should be considered as possibly indicating a pathologic condition; (*e*) cholesterol values of normal blood were obtained with a microcolorimetric method.

78. **Nutrition Investigations on Cottonseed Meal.**—Briefly, the authors' results indicate that cottonseed meal does not contain sufficient minerals for growth, is not actively toxic, contains efficient protein and perhaps fat soluble growth promoting substances, similar to those of butter fat, but in less adequate quantities.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

June, VIII, No. 6, pp. 273-337

81 *Influence of Salicylate on Metabolism in Man. W. Denis and J. H. Means, Boston.
82 *Explanation of Laxative Action of White Mustard Seed. E. G. van Leersum.
83 Reactions of Blood Vessels to Certain Chemicals. I. A. Hirschfelder, New York.
84 *Action of Atropin Sulphate on Isolated Stomach and Bowel of Dog. E. Zunz and J. Tysebaert.

81. **Influence of Salicylate on Metabolism.**—The results obtained in a study of three men on whom Denis and Means made observations concerning the effects produced by the ingestion of sodium salicylate on the urine, feces, blood and on the respiratory exchange. In the case of two normal men the administration of large doses of sodium salicylate (up to 6.6 gm. per day) produced an increase in the excretion of nitrogen, phosphates and uric acid. In one case, this increased nitrogenous metabolism was accompanied by an increase in the basal metabolism and symptoms of salicylate intoxication (such as ringing in the ears). In the other case, a much greater increase in the urinary excretion of nitrogen (which extended throughout the after period) was observed but there was no increase in the basal metabolism and no symptoms of intoxication. In one mildly septic individual results similar to those secured with the second normal man were obtained. No change in the respiratory quotient occurred in any of these subjects.

82. **Laxative Action of White Mustard Seed.**—Van Leersum shows that this is due to the formation of hydrogen sulphid from the white mustard seed.

84. **Action of Atropin Sulphate on Stomach and Bowel.**—The experiments made by Zunz and Tysebaert showed that the stomach and intestine of the dog isolated half an hour

after a hypodermic injection of 1 mg. atropin per kilo only contract weakly and with diminishing strength. The tone falls rapidly. The same is true for the stomach. These effects persist as a general rule for five or six hours or longer, at any rate in the intestine. The same depressant action may be obtained after 0.1 mg. or 0.005 mg., while after 0.001 mg. the movement is normal though the tone falls rapidly. The production of the substance which excites movement and the reaction of the intestine to this substance did not seem to be influenced by the previous injection of atropin. The extract of the stomach or of the intestine has no influence on the contraction or tonus of the isolated stomach.

Kentucky Medical Journal, Bowling Green

June, XIV, No. 6, pp. 291-354

85 General Plan for Schedule of Medical Fees. J. N. McCormack, Bowling Green.
86 Surgery in Mountains of Kentucky. M. C. Kash, Salyersville.
87 Courteous Physician. W. B. Salen, Stamping Ground.
88 Anaphylaxis. W. R. Thompson, Mt. Sterling.
89 Local Anesthesia. C. C. Howard, Glasgow.
90 Influenza; Etiology and Pathology. R. T. Hocker, Arlington.
91 Symptoms and Diagnosis of Influenza. J. F. Dunn, Arlington.
92 Complications and Sequelae of Influenza. T. J. Marshall, Bardwell.
93 Treatment of Influenza. W. Z. Jackson, Arlington.
94 Breast Tumors. J. B. Lukins, Louisville.
95 Present Status of Diagnosis and Surgical Treatment of Gastric and Duodenal Ulcers. J. R. Wathen, Louisville.
96 Nuclein. W. Sanders, Louisville.
97 Medical Inspection of Schoolchildren. C. J. Rosenham, Louisville.
98 Active and Passive Immunization; Essential Difference Between Vaccine and Serum Therapy. J. D. Allen, Louisville.
99 Abscess of Mesentery With Gangrene of Small Intestine. E. S. Allen, Louisville.
100 Treatment of Syphilis; Report of Cases. C. W. Jefferson, Louisville.
101 Case of Bacillus Aerogenes Capsulatus Infection With Recovery. G. H. Day, Louisville.
102 Country Obstetrics. R. N. Filiatrean, Sorgho.
103 Postoperative Ileus. A. H. Barkley, Lexington.
104 Resection of Stomach for Calloused, Saddle Ulcer of Lesser Curvature. I. Abell, Louisville.
105 Contagion and How To Combat It. J. W. Crenshaw, Cadiz.
106 Therapeutic Measures Other Than Drugs. C. Pope, Louisville.
107 Treatment of Carbuncle. D. W. Gaddie, Hodgenville.

Medical Record, New York

June 17, LXXXIX, No. 25, pp. 1071-1126

108 Some of Larger Problems of Medical Profession. R. Blue, Washington, D. C.
109 Nauheim Method. S. Baruch, New York.
110 Scheme of State Control for Dependent Infants. H. D. Chapin, New York.
111 Case of Angioma of Larynx. E. Mayer, New York.
112 Four Cases of Duodenal Ulcer, Mistaken for Chronic Appendicitis. R. Lewisohn, New York.
113 Dyspnea: Brief Review of Its Occurrence and Significance. J. W. Smith, Jr., Brooklyn.

June 24, No. 26, pp. 1127-1176

114 What Is Position Today as to Value of Blood and Cerebrospinal Fluid Examinations in Diagnosis of Syphilis of Nervous System? E. D. Fisher, New York.
115 Medical Treatment of Gastric and Duodenal Ulcer. F. B. Turck, New York.
116 Fermented Milk in Infant Feeding. A. E. Mucklow, Brooklyn.
117 Fetal Dystocia and Cesarean Section. H. Grad, New York.
118 Vomiting in Infancy. J. Epstein, New York.
119 Methods and Mydriatics in Refraction. E. A. Pond, Brooklyn.

Military Surgeon, Washington, D. C.

June, XXXVIII, No. 6, pp. 601-718

120 Operations for Craniocerebral Wounds of Modern Warfare. H. Cushing, Boston.
121 Sanitary Problems of Trench Warfare. F. R. Keefer, U. S. Army.
122 Base Hospital Work in Russia. H. H. Snively, N. G. Ohio.
123 Relation of United States Public Health Service to First Aid. W. C. Rucker, Washington, D. C.
124 Proper Functions of Medical Department in Relation to General Staff Work. E. L. Munson, Washington, D. C.
125 Occurrence of Hydrophobia in Foxes of Alaska. T. L. Ferenbaugh, U. S. Army.
126 New Field Belt for Medical Officers. R. B. Miller, U. S. Army.

Modern Hospital, St. Louis

June, VI, No. 6, pp. 393-472

127 Convalescent Field — Its New and Changing Border Lines. F. Brush, New York.
128 Heating Systems for Hospitals of Various Sizes. F. Sutton, New York.
129 New Wesley Hospital, Kansas City, Mo. L. B. Simpson and R. E. Castelaw, Kansas City, Mo.
130 Some Glaring Faults in Hospital Construction. C. F. Neergaard, Brooklyn.
131 Municipal Receiving Hospital for Detroit. J. Scott, Detroit.
132 Small Community Hospital — Its Creation. (To be continued.) J. A. Hornsby, Chicago.
133 Compulsory State Wide Health Insurance and Its Relation to Medical Service. E. R. Hayhurst, Columbus.
134 Boiler and Engine Room Economies. O. E. Goldschmidt, New York.
135 Vast Welfare Activities Under Way. L. A. Coolidge.

New Orleans Medical and Surgical Journal

June, LXVIII, No. 12, pp. 765-824

136 Centrifuge Concentration of Malaria Plasmodia for Diagnostic Purposes. F. M. Johns, New Orleans.
137 Intracapsular Fractures of Femur. J. T. Nix, Jr., New Orleans.
138 Control of Diphtheria in Public Schools and Cultural Survey of Newcomb College. E. Moss, New Orleans.
139 Cultural Survey of Tulane University. W. A. Love, New Orleans.
140 Clinical Aspects of Diphtheria. R. C. Lynch, New Orleans.
141 Acidosis. O. W. Cosby, Monroe.
142 Causes and Treatment of Dyspnea in Circulatory Disease. J. T. Halsey, New Orleans.
143 Cases of Pneumococcus Arthritis and Very Unusual Type of Bronchopneumonia. A. L. Levin, New Orleans.
144 Abdominal Pain, Especially When Associated With Abnormal Temperature, Indication for Caution in Use of Purgatives. J. Smyth, New Orleans.

New York Medical Journal

June 24, CIII, No. 26, 1209-1248

145 Value of Autoserum Injections in Skin Diseases. W. S. Gotthold, New York.
146 Tracheobronchial Syphilis. H. Arrowsmith, New York.
147 Nephritis in Aged. I. L. Nascher, New York.
148 Nonsurgical Treatment of Colonic Stasis. G. H. Evans, San Francisco.
149 Notes From First Surgical Division of Sea View Hospital. A. Nicoll and M. J. Horan, New York.
150 Case of Adenocarcinoma of Colon. S. R. Crothers and R. Kilduffe, Jr., Chester, Pa.
151 Plea for Male Nurses. P. S. Stout, Philadelphia.
152 Pathologic Conditions in Hematuria and Pyuria. A. S. Sanders, New York.

Northwest Medicine, Seattle, Wash.

June, XV, No. 6, pp. 185-216

153 Some Late Manifestations of Syphilis as Shown by Clinical Observation or Wassermann Tests. G. S. Whiteside, Portland, Ore.
154 Some Indefinite Nervous Conditions Due to Latent Syphilis of Brain or Cord. G. Baar, Portland, Ore.
155 Improper Management of Ordinary Acute Case of Gonorrhea and Review of Few Practical Points in Diagnosis and Therapeutics, Important but Commonly Neglected. F. L. Ashton, Seattle.
156 Nonspecific Posterior Urethritis Factor in Urinary Diagnosis and Treatment. H. W. Howard, Portland, Ore.
157 Infection of Urinary Tract With Colon Bacillus and Treatment of Condition. A. C. Behle, Salt Lake City.
158 Modern Cystoscope. L. Thompson, Hot Springs, Ark.
159 Rules Governing Commitment of Persons to State Mental Hospital. D. H. Calder, Provo, Utah.
160 Pathology of Insanity. J. W. Givens, Orofino, Ida.
161 Attitude of Hospitals in Operations on Unruptured Ectopic Pregnancy. B. H. Foreman, Tacoma, Wash.

Ohio State Medical Journal, Columbus

June, XII, No. 6, pp. 377-472

162 Restoration of Vision in Amblyopic Eyes by Intensive Methods. I. G. Clark, Columbus.
163 Comment on Methods. C. F. Clark, Columbus.
164 Question of Curability and Duration of Treatment in Syphilis. L. A. Levison, Toledo.
165 Extra-Uterine Pregnancy. F. F. Lawrence, Columbus.
166 Problem of Delinquency. A. F. Shepherd, Columbus.
167 Military Medicine or "Medical Preparedness." W. S. Keller, Cincinnati.
168 Case of Pellagra. T. H. Infield, Zanesville.
169 Pelvic Rest, Designed By. D. V. Courtright, Circleville.

Oklahoma State Medical Association Journal, Muskogee

June, IX, No. 6, pp. 137-184

170 Hospitals. J. S. Hartford, Oklahoma City.
171 Physician—Some of His Duties and Responsibilities. J. S. Fulton, Atoka.
172 Value of Healthy Childhood. C. Puckett, Pryor.
173 Oklahoma Workmen's Compensation Law. A. A. McDonald, Oklahoma City.

Tennessee State Medical Association Journal, Nashville

June, IX, No. 2, pp. 69-110

174 *What Results Have Newer Tests for Kidney Function Brought Internist? J. B. McElroy, Memphis.
175 Treatment of Syphilis. P. Bromberg, Nashville.

176 Public Health Situation as Portrayed by Mortality Records. H. H. Shoulders, Nashville.
177 *Simplified Technic in Application of Schick's Reaction for Testing Immunity to Diphtheria. W. Litterer, Nashville.

174 and 177. Abstracted in THE JOURNAL, April 22, pp. 1347 and 1349.

Texas State Journal of Medicine, Fort Worth

June, XII, No. 2, pp. 55-120

178 Mental Health. G. H. Moody, San Antonio.

West Virginia Medical Journal, Huntington

June, X, No. 12, pp. 339-434

179 Some Medical Problems and Remedy. A. P. Butt, Davis.
180 Accessory Sinusitis. E. D. Wells, Hinton.
181 Report of Medical Inspection in West Virginia State Schools. H. B. Jones, Glendale.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Radiology and Electrotherapy, London

June, XXI, No. 1, pp. 1-40

1 Roentgenography in Diagnosis of Diseases of Accessory Nasal Sinuses. H. M. Berry.
2 Movements of Foreign Bodies in Brain. G. Vilvandre and J. D. Morgan.

British Journal of Children's Diseases, London

June, XIII, No. 150, pp. 161-192

3 Fainting Attacks in Children. R. Hutchison.
4 Case of Epidemic Catarrhal Jaundice; Meningism; Death. J. A. Procter and G. Ward.
5 *Two Cases of Intestinal Obstruction in Children. T. J. Wood.

5. **Intestinal Obstruction in Children.**—One of the cases cited by Wood was a tuberculous tumor of the mesentery and intestine; the other was a case of cyst of the mesentery causing volvulus.

British Medical Journal, London

June 3, I, No. 2892, pp. 777-808

6 Influence of Antiseptics on Activities of Leukocytes and on Healing of Wounds. C. J. Bond.
7 Soldier's Foot and Treatment of Common Deformities of Foot. R. Jones.
8 *Louse Problem at Western Front. A. D. Peacock.
9 Pediculus Humanus (Vestimenti) and Pediculus Capitis. A. Bacot.
10 *Best Methods of Destroying Lice and Other Body Vermin. J. P. Kinloch.
11 Treatment of Infected Wounds by Physiologic Methods. A. E. Wright.

8. **Method of Killing Lice.**—The best killing agent for lice, Peacock says, is a mixture consisting of naphthalene 96 per cent., creosote 2 per cent., and iodoform 2 per cent.

10. **Destruction of Lice and Other Body Vermin.**—According to Kinloch the efficiency of naphthalene, creosote and iodoform mixture would not suffer in any material degree if magnesium silicate were substituted for iodoform, and because of the high price of iodoform such a substitution is of great advantage. In a series of experiments powders were prepared, with magnesium silicate as a basis, and containing various actively insecticidal liquids, such as trichlorethylene and creosote, and were compared with powders containing similar liquids, but with naphthalene as the basis. In every case the greater efficiency of naphthalene as a basis for the powders was substantiated. Experiments were also made for the purpose of ascertaining whether the creosote could be advantageously replaced by another insecticide. These experiments showed that when all conditions are taken into account, creosote is the most valuable of the actively insecticidal liquids for admixture with naphthalene in an insecticidal powder.

Glasgow Medical Journal

June, LXXXV, No. 6, pp. 377-436

12 Etiology and Treatment of Gastric Ulcer. (To be continued.) H. Morton.
13 *Rupture of Pregnant Diverticulum of Uterus. A. N. McLellan.
14 Eight Hundred Cases of Anesthesia With Vernon Harcourt Chloroform Inhaler. H. P. Fairlie.

13. **Rupture of Pregnant Diverticulum of Uterus.**—In the case cited by McLellan the pregnant sac was perfectly smooth and uniform on its surface, except at one point, where it was united by a thick, fleshy pedicle to the lower part of the body of the uterus in front. It had no attachment to tube or ovary and an apparently normal uterus, with normal adnexa, lay behind it. McLellan, therefore, came to the conclusion that he was dealing with a pregnancy in a diverticulum of the uterus. The patient, 23 years of age, was admitted to the infirmary in a state of collapse. For over five months before the date of admission her menstrual periods had been in abeyance, and she believed herself to be pregnant. For fourteen days before admission she had felt occasional sharp pains in the left iliac region. On the evening of the day of admission she was seized with a sudden severe pain in the left side, as if she had received a blow; this was followed by collapse. No detailed examination was made on account of the patient's precarious condition; but the outlines of a fetus could easily be made out lying immediately beneath the anterior abdominal wall. An hour later the abdomen was opened by a subumbilical median incision. Its cavity was full of blood, partly fluid, partly clotted; and a fetus of about six months could be felt lying free in it. The cord was ligatured and the fetus removed. After the blood had been mopped up the cord was traced to the placenta, which projected to the extent of half its volume from a muscular sac. Posteriorly, and near its lower border, the sac was attached by a fleshy pedicle, about the thickness of the thumb, to the front of the uterus a little above the level of the bladder. The pedicle was tied and the sac was removed. A slightly enlarged and softened uterus, with normally situated tubes and ovaries was then revealed. There was no indication of a duplex or bicornuate condition of the uterus. The patient made an easy recovery.

Journal of Laryngology, Rhinology and Otology, London

June, XXXI, No. 6, pp. 225-272

15 Dacryocystorhinostomy; Its Indications and After-Treatment. J. H. Horgan.
16 Atrophic Rhinitis (Ozena) and Tuberculosis. J. Mackeith.
17 Reports for Year 1915 From Ear and Throat Department of Royal Infirmary, Edinburgh. A. L. Turner.

Journal of Tropical Medicine and Hygiene, London

June 1, XIX, No. 11, pp. 129-140

18 Experiments on Polyneuritis in Pigeons. A. Breinl.
19 Ankylostomiasis; Diagnosis and Treatment. R. D. Keith.

Lancet, London

June 3, I, No. 4840, pp. 1111-1156

20 Typhus in Serbia. (To be continued.) R. O. Moon.
21 Case of Acute Diabetes. W. G. Smith.
22 *Treatment of Septic Wounds, With Special Reference to Use of Salicylic Acid. L. G. Anderson, H. Chambers and M. Lee.
23 Ill-Treatment of Genital Prolapse. W. E. Fothergill.
24 Factor in Treatment of Head Injuries and Allied Conditions. T. E. Harwood.
25 Spinal Anesthesia. S. B. Gadgil.
26 *Function of Medullary Nerve Sheath. C. E. H. Milner.
27 Rupture of Bladder Due to Retroverted Gravid Uterus. J. E. G. Calverley.
28 Anesthetization of Two Cases of Patent Ductus Arteriosus. H. R. Phillips.
29 Cockroach; Its Destruction and Dispersal. J. J. H. Holt.

June 10, No. 4841, pp. 1157-1202

30 Typhus in Serbia. R. O. Moon.
31 Cases of Intestinal Disorders Arising From Protozoal Infection. B. R. G. Russell.
32 Cases of Lamblia Intestinalis Infections From Gallipoli. A. M. Kennedy and D. D. Rosewarne.
33 Nature and Distribution of Parasites Observed in Stools of One Thousand Three Hundred and Five Dysenteric Patients. H. B. Fantham.
34 Cysts of Giardia (Lamblia) Intestinalis in Human Dysenteric Feces. A. Porter.
35 Spinal Anesthesia. H. M. Page.
36 Treatment of Anaphylaxis. A. S. Leyton and H. G. Leyton.
37 Prevention of Fly Breeding in Horse-Manure. S. M. Copeman.

22. **Septic Wounds Treated With Salicylic Acid.**—The conclusions drawn by the authors from their observation of 1,000 cases are: 1. The bactericidal action of many of the so-called antiseptics when applied to septic wounds is negligible. 2. The majority of wounds heal without the applica-

tion of an antiseptic, provided free drainage is supplied and dressings are changed frequently. Hypertonic saline, in so far as it aids physiologic processes, is preferable to many so-called antiseptics. 3. A strong antiseptic can sterilize the surface of a wound with which it comes in contact, and, if applied continuously, gives excellent results. 4. Salicylic acid applied in a suitable form can often save cases when other methods have failed. It is particularly useful when dressings cannot be repeated at frequent intervals. The method has been to keep a saturated solution of salicylic acid in alcohol and to add a little of this to the last funnelful of saline solution with which the wound is irrigated in a proportion of 2 to 3 drams to a pint. If applied in this way suspended in saline solution the crystals can be deposited over the surface and reach every part of the wound. They pass into solution slowly and exert a continuous bactericidal action. This method has the advantage that drainage tubes can be used and free exit for discharge maintained. Dusting the wound with the dry powder has the disadvantage that the crystals float and do not reach deep crevices. If the crystalline deposit reaches all parts of the wound in cases in which exudation is being discharged an immediate diminution occurs in the number of living bacteria on the surface of the wound. A thick paste of salicylic acid in sterile saline (1 gm. acid, 9 c.c. saline) has been used for the cut surfaces of long bones in septic amputations. In some cases the stumps have healed by first intention. In others slight sepsis occurred in the muscular flaps. In every case no infection of the bone marrow occurred.

26. **Function of Medullary Nerve Sheath.**—Apart from its action as a protective buffer against injury to the nerve fibers, there has always existed some doubt as to the function of the medullary nerve sheath, and physiologists have from time to time held different views. The fact that in two cases of nerve trauma there was in one a loss of voluntary physiologic excitability in a muscle without loss of faradic reaction and in the other a return of voluntary physiologic excitability without return of faradic reaction, leads Milner to believe that the medullary sheath acts as a conductor for the electric current; while its existence is unnecessary for the transmission of physiologic impulses, which are dependent solely on the continuity of the axis cylinders. In a case quoted of division of the spinal accessory nerve, it was found that the physiologic impulse failed from the outset to reach its destination, whereas the electric impulse persisted until the eighth day.

Medical Journal of Australia, Sydney

May 13, I, No. 20, pp. 393-410

39 Temperament. R. T. Michell.
Cyst of Pancreas; Resection of Body and Tail; Recovery. E. Meyer.

Bulletin de l'Académie de Médecine, Paris

May 23, LXXV, No. 21, pp. 607-646

40 *Inherited Syphilis Predisposes to Intestinal Diseases. (L'intestin des hérédo-syphilitiques.) Gaucher.
41 *Association of Colors With Certain Figures and Words. (De l'encéphalopsie chromatique.) R. Blanchard.
42 *Transplantation of Cartilage in Surgical Repair. H. Morestin.
43 Cerebrospinal Meningitis; Fifty-Six Cases. Rubinrot.

40. **Inherited Syphilis as Predisposing to Intestinal Disease.**—Gaucher's thirty years of experience have convinced him that the enterocolitis of young infants is particularly frequent on a basis of inherited syphilis. No one thinks of syphilis as being responsible for the persisting bowel trouble in the young infant; the food is incriminated, and one change made after the other, all to no avail. He says that these are the children that develop appendicitis later, and that Segond told him, a few weeks before his death, that he had found signs of syphilis in all his operative cases of appendicitis, confirming Gaucher's statement in 1904 in regard to the syphilitic origin of appendicitis. In any event, he declares, treatment for the syphilis should be commenced at once, to supplement the usual measures.

41. **Association of Colors with Figures and Words.**—Blanchard devotes twenty-five pages to a comprehensive study of what he calls "chromatic encephalopsia," with bibliography. His attention was attracted to the subject by two cases personally observed. The two young women had the internal perception of certain colors, one when she heard, read or thought of certain figures; the phenomenon occurred with the days of the week in the other case. In both it dated from childhood, but it finally gradually subsided in the first case but persists unmodified in the other. He compares with these the various cases of psycho-chromesthesia on record, and emphasizes that the phenomena are all in the psychologic sphere. They are exceptional, but not abnormal in the pathologic sense of the word.

42. **Cartilage Flaps for Surgical Repair.**—Morestin expatiates on the various advantages of a cartilage transplant for repairing a breach in the skull, repairing the orbit, lower jaw and other joints where a stiff and durable substance is required. He has found the costal cartilages best adapted for the purpose, especially the sixth, seventh and eighth costal cartilages from the same or another person. He fills the breach with scraps of cartilage or the cartilage entire, sometimes leaving arms to project beyond. No suturing is required; the suturing of the soft parts above holds all in place. The perichondrium surface is turned inward as this side is apt to curve. The fragments blend and grow together and grow solidly to the adjoining tissues. By the end of a few days the gap is thus filled with a solid mass, and the skull or other bone seems regular and solid. Morestin thinks that the cartilage persists as such, as he has seen no evidence of ossification. His experience in the repair of war wounds has confirmed his assertions during the last two years that cartilage is the easiest of all tissues to transplant, and the best of all for purposes of repair where a light skeleton is sufficient.

Paris Médical

May 27, VI, No. 22, pp. 489-504

44 *Vaccination Against Typhoid in the Japanese Army. M. Yagisawa.
45 Devices for Working Appliances After Amputation of the Hand. (Mains de travail pour les amputés.) Bourcau.
46 Trophic Disturbances in the Fingers Consecutive to Superficial Shell Wounds. A. Mouchet and P.-Delpech.
47 *Acute Meningitis During Course of Acute Articular Rheumatism: Cerebral Rheumatism. (Contribution à l'étude du rhumatisme cérébral.) J. Colombe.

June 3, No. 23, pp. 505-548

48 Modifications of the Psychomotor and Emotional Reactions After Trephining. (Les réactions psychomotrices et émotives des trépanés.) J. Camus and Nepper.
49 *Alcohol Blocking of Nerve to Arrest Muscular Contracture. (L'alcoolisation tronculaire au cours des acromyotomies rebelles du membre supérieur.) J.-A. Sicard.
50 Cortical Anesthesia After Injury of the Skull. (Les anesthésies corticales à topographie atypique dans les traumatismes crâniens.) M. Villaret and M. F.-Beaulieu.
51 Disturbance in Equilibration After Concussion of the Brain. (Les troubles de l'équilibre dans les commotions crâniennes.) Cestan, P. Descomps and R. Sauvage.
52 Traumatic Hysteria Persisting for Fifteen Years. (Cas d'hystérie traumatisme revu 15 ans après les accidents initiaux.) P. Chavigny and L. Spillmann.
53 Hemianopsia of Cortical Origin. F. Terrien and Vinsonneau.
54 Case of Almost Pure Organic Hemi-Anesthesia. (A propos de l'hystérie: sur un cas d'hémianesthésie organique presque pure.) A. Léri.
55 Cicatricial Localized Paresthesias. (Topoparesthésies cicatricielles. Examen des troncs nerveux et des cicatrices dans les blessures des nerfs.) A. Thomas.
56 *Aphasia With Left Hemiplegia From Ligation of Right Common Carotid. J. Ferrand.
57 Latent Wounds of Vessels and Their Nerves. (Les blessures latentes des paquets vasculo-nerveux dans une formation de l'avant.) M. Stassen and J. Voncken.
58 Electric Tests of Conducting Power of Nerve Under Compression. (Des réactions électriques du nerf dans la compression nerveuse.) G. Battez and R. Desplats.

44 **Vaccination Against Typhoid in the Japanese Army.**—Yagisawa gives tabulated statistics which demonstrate anew the advantages of vaccination against typhoid. It not only reduced the morbidity but had a marked attenuating influence on the disease when it occurred. During the period between the war with China and the war with Russia (1897 to 1903), the morbidity averaged 5 per thousand of the average force of 125,629 troops, with a mortality of 1 per thousand. Then

the morbidity increased to 8 and the mortality to 1.3 per thousand. Antityphoid vaccination was then introduced, in 1908, and the morbidity dropped to 0.7 and the mortality to 0.08 per thousand among those vaccinated more than once while the figures remained at the same height among the nonvaccinated and the civilian population. Other tables compare the course of the disease in the 412 vaccinated who developed it and in the 2,533 nonvaccinated, showing the comparative mildness in the former. One table lists the interval between the vaccinations and the onset of the disease. In 69 the interval approached or surpassed one year. Intestinal hemorrhage occurred in only 6 per cent. of the 266 vaccinated typhoid patients and in 16.4 per cent. of the 122 nonvaccinated. Those vaccinated only once are listed with the nonvaccinated.

47. **Acute Meningitis in Acute Articular Rheumatism.**—In the case reported, tuberculosis and syphilis could probably be excluded and drugs had not been given in amounts sufficient to explain the meningeal irritation. Hence Colombe is inclined to accept it as a case of the rheumatism virus acting on the meninges as well as on the joints. The joint symptoms became attenuated as the meningitis developed. The lumbar puncture fluid was apparently sterile, with polynuclears and lymphocytes in abnormal numbers and with abnormal outlines.

49. **Alcohol Blocking of Trunk Nerve for Paradoxic Contracture after War Wounds.**—This number of the *Paris Médical* is devoted entirely to the neurologic aspect of gunshot and shell wounds. Sicard's further experience has confirmed the instructive findings when a tourniquet is applied high up on the arm. As the circulation is arrested, the contracture yields while contraction from retraction of tissues persists unmodified. As soon as the Esmarch band is removed the contracture returns as before. This reflex contracture is primarily an effort of defense against pain but it soon assumes a permanent character, absolutely rebellious to all ordinary measures and rendering the hand totally useless as a rule. In old rebellious cases of this kind Sicard has succeeded in restoring normal conditions by injecting alcohol directly into the trunk nerve, which is exposed for the purpose. He injected usually under local anesthesia 1 c.c. of a 20 per cent. solution of alcohol (*alcool à 20°*). This blocks the nerve enough for the purpose, while permitting complete recuperation later. Almost immediately the contracture relaxes and the pain subsides. The fingers are straightened, cotton pads placed between them and the hand wrapped in cotton and a plaster dressing. The plaster is removed in from one to three weeks and the fingers gently exercised and kept in a good position. Eleven of the twenty-three patients given this treatment immeasurably improved in the course of two or three months. But the after-treatment, to maintain what has been gained, must be systematic and persevering. Better results were obtained with flexion contracture than with contractures in extension.

56. **Aphasia and Hemiplegia after Ligation of Common Carotid.**—Six days after a bullet had entered the neck on the right side it was found protruding from the common carotid which it had severed for three fourths of its diameter. The impacted bullet was all that had prevented fatal hemorrhage. It was necessary to ligate the artery above and below the injury, and the wound soon healed. The man was unconscious for two days. When he roused his left side was paralyzed and there was total aphasia. Although he had been a skilled accountant, all knowledge of figures had vanished. The aphasia was more of the type of an intellectual deficit than of disturbance in speech. The derangement in the circulation in the right hemisphere was probably responsible for it. Ferrand calls attention to this case as further testimony to the assumption that the mental faculties are not connected with certain narrow localizations.

Presse Médicale, Paris

June 1, XXIV, No. 31, pp. 241-248

59 *Treatment of Painful Neuritis From War Wounds by Direct Injection of Alcohol Into the Nerve. (Traitement des causalgies par l'alcoolisation nerveuse locale.) J.-A. Sicard.

60 *Tenon and Mortise Joint to Restore Shape and Strength to Bone After Limited Resection. (Sur un procédé de coaptation osseuse par tenon et mortaise supprimant le greffon et la suture metallique.) J. Calvé.

June 5, No. 32, pp. 249-256

61 Possible Complications of Gonorrhea and Soft Chancre. (A propos de la prophylaxie des maladies vénériennes autres que la syphilis.) A. Renault.

62 *Coma in Diabetic Drunkard. (Le coma éthylo-diabétique.) E. Schulmann.

59. **Alcohol Blocking of Nerve in Treatment of Causalgia from War Wounds.**—Sicard reports that in twenty-one cases painful neuritis rebellious to all other measures has been successfully combated by injection of alcohol directly into the nerve trunk. Others have had similar experiences so that he now knows of forty-three cases of relief by this means of the persisting paroxysms of pain. All the nerve trunks tributary to the pain must be blocked. The alcohol must be 60 or 80 per cent. (*alcool à 60 degrés*); weaker than this it fails of its purpose. The fear of motor disturbance is negligible in comparison to the agonizing suffering from the causalgia, especially as the nerve recuperates from the alcohol in eight or ten months so that any damage from it is only temporary. He has repeatedly found that the electric reaction of degeneration, complete at first after the injection of alcohol at 70 degrees into the nerve, had subsided entirely by the end of the fourth to the eighth month, the electric response then being quite normal. Some of the results obtained in these painful neuritis cases were baffling favorable. In some cases partial paralysis retrogressed as the pain disappeared after the nerve blocking. One soldier with intensely painful median paralysis from a wound on the inner aspect of the arm had had two operations to expose the nerve but without benefit. After six months of suffering the injection of alcohol not only banished the pain but restored the complete use of the hand, some ability to bend the fingers returning by the next day. Results like these can be explained only by assuming that the sensory fibers are more sensitive than the motor fibers to the action of alcohol, or else that the intense pain had inhibited the motor function, and it returned as the neuralgia subsided. There has been but one failure in the forty-three cases that he has compiled. In this case the alcohol had been injected at the site of the lesion, instead of above it, the customary technic. The interval since the nerve blocking has been over a year in a number, and the cure has been complete to date. Motor functioning has been regained in nearly every case when the wound was not so extensive as to debar this permanently.

60. **Mortise Joint after Resection of Long Bone.**—Calvé gives an illustration of a method of cutting the stumps so they will dovetail into each other, a regular tenon and mortise joint. This coaptates the stumps so that they hold firm and strong, restoring the shaft complete except for the resected portion. The method is applicable only when a short segment was resected, but the special interlocking as illustrated prevents any displacement in any direction, without the use of any foreign body.

62. **Diabetic Coma in Delirium Tremens.**—These two conditions seemed to be superposed in the two cases reported. Both the diabetic coma and the delirium tremens retained their characteristics, but the combination proved fatal in each case.

Revue Médicale de la Suisse Romande, Geneva

May, XXXVI, No. 5, pp. 273-344

63 Modern Treatment of Malignant Tumors. Berdez.

64 Valves of the Navicular Fossa in the Urethra. (Note sur les valvules de la fosse naviculaire du canal de l'urètre chez l'homme.) N. Loewenthal.

65 Research on Alkaloid From the Bark of the Pomegranate. (Etude pharmacodynamique sur la pelletiérine.) Loup.

Correspondenz-Blatt für Schweizer Aerzte, Basel

May 27, XLVI, No. 22, pp. 673-704

66 *A Year of Military Surgery. (Quelques remarques sur la chirurgie de guerre.) Julliard.

67 Atropin Poisoning. Two Cases. Belladonna Root Sold by Wholesale House in Place of Inula Root. (Eine Vergiftung mit Radix Belladonnae.) H. Hunziker.

66. **A Year of Military Surgery.**—Julliard reviews his experiences as chief of a Red Cross hospital at Lyons. They

confirm the assumption that persisting suppuration invariably indicates the presence of some foreign body or sequester. Any operation on such a patient is followed by high fever, but it is generally transient. The operation, however, is liable to rouse some latent infection. He had one case of tetanus, fatal in eight days, which developed during the afebrile healing of a wound of the ilium. The projectile had been extracted one month after the injury, and the tetanus made its clinical appearance a month later. It had been preceded by a recrudescence of the suppuration without appreciable cause. This tardy tetanus from liberation of latent spores by some operative intervention has been reported by a number of surgeons. He says that in his efforts to keep from amputating he went to the opposite extreme and not only lost precious time but obtained poorer functional results than when he amputated in other cases. Another point he learned, which is important in managing industrial accidents, is that the flaps left after an amputation must never be sutured, as this is liable to hold back secretions and entail severe infectious phenomena. He noted also that men wounded in the head seldom recovered when diffuse brain symptoms became manifest. But those with localized symptoms usually recovered when the wound was treated promptly. Wounds of the skull, he reiterates, should be examined and operative measures applied without delay and the men should be kept on the spot until out of danger—no attempt should be made to transfer those wounded in the skull.

Policlinico, Rome

May 21, XXIII, No. 21, pp. 645-676

68 Stereoscopic Roentgenography. (Note di radiostereoscopia.) P. Alessandrini.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

May 20, I, No. 21, pp. 1773-1864

69 *The So-Called Congenital Megacolon. (Ziekte van Hirschsprung.) R. de J. de Jong.

70 *Chronic Articular Rheumatism. (Het chronisch rheumatisch gewrichtslijden in Nederland.) J. van Breemen. Concluded in No. 22.

May 27, No. 22, pp. 1925-2012

71 Experimental Research on Vaccinal Allergy. II. R. P. Van de Kasteele.

72 Treatment of Tuberculous Peritonitis. (De heelkundige behandeling der tuberculeuse buikvliesontsteking.) P. H. Van Rooijen.

73 Permanent Paralysis of the Superior Oblique Muscle After Killian's Operation for Frontal Sinusitis. (Een geval van blijvende verlamming van den M. Obliquus superior na een operatie volgens Killian.) G. Ten Doesschate and A. De Kleyn.

69. **Hirschsprung's Disease.**—De Jong has found a valve formation in the bowel responsible for certain cases of megacolon. The colon was not abnormally large to start with, but the obstruction from the valve soon entailed the clinical picture of Hirschsprung's disease. He found that no fluid passed into the rectum when injected into the colon of the cadaver of one 3-months-old child who had succumbed to inability to void feces. The colon was injected with formaldehyd in situ, and this showed up plainly the two or three folds in the mucosa acting like a valve to close the outlet. Neither the colon, the flexure nor the mesentery seemed to be naturally excessively large. The valve-like folds were responsible for the stoppage of the feces. He insists that the findings in this and other similar cases demonstrate that the term megacolon congenitum is a misnomer. In a recent case of similar disturbances the first signs of trouble, pain and constipation, developed at the age of 44, finally presenting the picture of complete ileus. The giant sigmoid flexure was resected and there has been no further trouble since. There was nothing like a valve formation in this case, but the flexure and its mesentery probably had been naturally abnormally large and a long period of constipation resulted in the filling and stretching of the flexure. Probably many cases of this kind have been classed as true Hirschsprung's disease, and yet in reality they have nothing in common with it except the large sigmoid flexure.

70. **Chronic Rheumatic Joint Affections in the Netherlands.**—Van Breemen discusses in turn what he calls the seven types of chronic rheumatic joint disease: deforming arthritis, fibrous rheumatism, deforming arthritis of a single large joint, chronic arthritis of the vertebrae, pseudorheumatism, and subchronic and chronic articular rheumatism, the latter including also the joint troubles of the arthritic diathesis and of "rheumatoid tuberculosis." This classification is a guide to treatment. He has never known of a case of deforming arthritis, including that of the vertebrae, in which a cure was realized. But even although the joint may be badly deformed, systematic courses of physical measures may ward off crippling. The main reliance in deforming arthritis is on massage, rubbing and kneading, to get rid of the infiltrations which interfere with the use of the joint. General measures, steam and dry heat do little good, and the massage has to be done by an expert.

Exercise is an important factor in treatment of chronic rheumatism but the ordinary use of the joint is too strenuous exercise as a rule.

It is important to realize that with a tendency to rheumatism the limit of tolerance for exercise and for rest is abnormally low. The use of the joint must be restricted. Under "pseudorheuma" he reviews the joint troubles associated with exophthalmic goiter, heart disease, gonorrhea, etc. With gonorrheal arthritis Bier's hyperemia treatment should be given a trial. Every year he encounters cases of syphilitic joint troubles long treated for supposed rheumatism; the involvement of the periosteum and the location of the trouble should aid in differentiating. Tuberculous joint troubles in the aged are often mistaken for true rheumatism.

With a chronic rheumatic affection of the hip joint or other large joint in the aged, much benefit can be derived from cautious exercise. Diathermia is almost the only means to apply heat to the hip joint and it often proves useful. Fibrous rheumatism is secondary, and potassium iodid may help. During the progressing stage no attitude should be allowed that will compromise functioning later. The subchronic stage into which acute articular rheumatism may pass is often improved by steam baths and electric light baths, with massage, watching over the heart.

The arthritis of rheumatism never suppurates. The irritation starting it may be of bacterial, toxic or autotoxic origin.

The joint troubles with the arthritic diathesis are milder than most others, and they are liable to alternate in the course of years with neuralgia and muscular rheumatism, and to change about. So far as the diet is concerned, these patients should be treated as for gout. This is the only form of chronic rheumatic arthritis in which dietetic measures have displayed any efficacy in his experience.

Hospitalstidende, Copenhagen

May 24, LIX, No. 21, pp. 489-516

74 *Pregnancy Polyneuritis; Four Cases. V. Albeck.

75 *Support for Patients With Heart Disease So They Can Sleep Comfortably Sitting Up. (Et Hjaertebord.) K. Schroeder.

74. **Pregnancy Polyneuritis.**—Albeck describes four typical cases of this affection, all with brain symptoms accompanied by more or less loss of memory. The paresis, neuralgia and anesthesia were restricted to the legs in two cases; in the others the arms were involved, and one patient had in addition optic neuritis. The polyneuritis terminated fatally in three cases on record but Albeck's four patients recovered. The onset with uncontrollable vomiting, the tendency to delirium, the complete loss of memory for a few weeks or months, the scanty diuresis—all indicated toxic action as responsible for the polyneuritis. In one of his cases the polyneuritis symptoms and amnesia persisted from the third month nearly to the end of the pregnancy, and two years later the woman was under treatment for encephalitis. Two of the women were primiparae. In one woman of 32 the tendency to delirium and the amnesia persisted after delivery at term and contractures developed requiring tenotomy. The clinical picture of pregnancy polyneuritis is so grave and is liable to entail such serious disturbance that Albeck in his latest case interrupted the pregnancy, and benefit was apparent at once. The pains and paralysis subsided in the course of two weeks but the legs were still numb.

75. **A Support for Patients with Dyspnea.**—A broad pad in the shape of a wide horseshoe is mounted on a stout iron frame which straddles the bed or chair. As the patient sits up, he rests his arms on the soft horseshoe pad on a level with the diaphragm and leans his forehead against an adjustable soft head-rest mounted at the deepest point of the horseshoe pad. Patients who can get no rest otherwise sleep soundly with this contrivance without the aid of morphin. It is a great relief to have the weight of the arms lifted away from the body. Three illustrations are given.

Hygiea, Stockholm

LXXVIII, No. 9, pp. 529-608

76 *Fermentative Intestinal Indigestion. (Några ord om den intestinala jasningsdyspepsien—Schmidt.) L. Wolff.

77 *Syphilis of the Bladder. (Bidrag till kännedomen om syfilis i blåsan.) G. Nilson.

76. **Fermentative Intestinal Indigestion.**—Wolff expatiates on the necessity for exact differentiation of the factors inducing abnormal conditions in the intestines; the treatment required for one may be the opposite of what is required for another. He emphasizes the importance of ascertaining the way in which cellulose is digested as the guide to treatment. Where stomach and bowel are functioning to excess, cellulose is digested so completely that not enough residue is left to keep the bowels moving properly, and chronic constipation is liable to result. When stomach and bowel are functioning inadequately, the cellulose does not get digested enough, and the carbohydrates enclosed in the cellulose ferment. Certain persons seem to have a limit for digesting cellulose and above this limit they cannot go. The less constitutional this limitation, the easier it is to influence by diet and training. When the individual limit at the time is surpassed, the stools soon present the fermentation type, with diarrhea, and symptoms of dyspepsia and neurasthenia. "Gastrogenous" and "nervous" diarrhea do not present the fermentation type of stools. The fermentative type is semifluid or fluid, light yellow, foamy and full of gas, highly offensive with an odor of acetic and butyric acid. When mixed with water, the naked eye readily recognizes the remains of undigested potatoes as round lumps like grains of sago. In contrast to this, as a rule, there is very little mucus, and the microscope shows that there is remarkably little muscle residue or soaps. Wolff has encountered in the last two years ten cases of this fermentative diarrhea from inability of the intestines to digest cellulose. In some there was subacidity in the stomach, in others superacidity, and in some the stomach seemed to be functioning normally. In treatment the intestines must be guarded against being burdened with cellulose and substances that ferment readily. Farinaceous food of all kinds must be used very scantily, and these restrictions must be kept up for a long time. He advises to refrain from everything of the kind for a few days, living on well cooked meat, fish and gelatin preparations, eggs, bouillon, milk, tea, light wines and a little more sugar than usual. With this as the standard diet, variety can be obtained with a little honey, infants' artificial dextrinated foods, fine wheat flour dishes and tapioca. Later toast and biscuits may be allowed; then purées of fresh young green vegetables, stewed fruits and preserves. The diet is thus regulated by the proportion of cellulose and easy digestibility, guided by the character of the stools. The tolerance for cellulose may increase, but potatoes, uncooked vegetables and uncooked fruits must be avoided in every case for a long time or relapses may follow. He was impressed with the benefit derived in cases of deficient gastric secretion from the systematic administration of hydrochloric acid and pepsin. This aids not only in gastric digestion but in the digestion going on in the bowels. Even better results were obtained in some cases by supplementing this with pancreas ferment. A mild antiseptic for the bowels was also found useful, guaiacol carbonate plus nux vomica in small doses (0.05 gm. and 0.1 gm., respectively). He generally concludes the treatment with a course of natural iron mineral waters combined with some saline mineral water. This aids in toning up the general health and combating the anemia and nervousness which often accompany this type of "intestinal dyspepsia."

77. **Syphilis of the Bladder.**—In both the two cases reported by Nilson treatment for syphilis cured the bladder trouble completely. In the first case a man of 44 had recurring hematuria for five years without any subjective symptoms. The cystoscope then revealed numerous ulcerations in the bladder and cicatricial changes which suggested tertiary syphilis. The man failed to complete the course of treatment advised, and although normal conditions in the bladder were soon restored, he succumbed three years later to aneurysm of the aorta. In the other case, some small ulcerations in the bladder had been ascribed to tuberculosis, but they were evidently lesions of secondary syphilis, as they subsided under treatment for syphilitic lesions elsewhere. With bladder syphilis there is comparatively little subjective disturbance, and no tubercle bacilli can be detected. Syphilitic lesions elsewhere may yield the clue to the diagnosis, or the history of the case and the Wassermann reaction. Another point which suggests the syphilitic origin of the trouble is the failure of all other measures to cure the cystitis and the prompt response to treatment as for syphilis.

Ugeskrift for Læger, Copenhagen

May 18, LXXVIII, No. 20, pp. 785-830

78 *Drug Tests of Nerve Functioning. (Om farmakologiske Funktionsprøver særligt med Hensyn til Neurastenien.) A. Faber and H. J. Schou.

79 *Vaginism. (Et ejendommeligt Tilfælde af Vaginisme.) A. Neermann.

80 A Masked Knife for Opening Abscesses in Mouth or Throat. (En kacheret Kniv til Aabning af Abscesser i Mund og Svælg.) C. Mailand.

78. **Drug Tests of Nerve Functioning.**—Faber and Schou have been testing the response of the vagus and sympathetic nervous systems to injections of epinephrin, atropin or pilocarpin. They recapitulate the whole theory of vagotony and the experiments and clinical experiences in this line that have been published, and tabulate the findings with pilocarpin, epinephrin and atropin as obtained in turn in twenty patients with various affections, including a number with neurasthenia. No antagonistic action, such as Eppinger and Hess postulate, could be discovered between the different drugs. Sixteen responded with equal promptness to pilocarpin and to epinephrin; the response to both was weak in one; in the others the response was somewhat more lively to one than to the other, but in all the reactions to both paralleled each other more or less completely, regardless of the individual pathologic condition. Another table gives the findings in the stomach content after an Ewald test meal followed by injection of epinephrin and of pilocarpin. The secretion of saliva and of gastric juice was much increased after each, and nothing was observed that might be utilized to distinguish vagotony from sympathicotony. Table 4 gives the findings of the blood pressure after subcutaneous injections of epinephrin in 41 persons. The blood pressure increased from 35 to 47 per cent. in 19 men and from 9 to 43 per cent. in 20 women, but the increase averaged only 8 per cent. in 2 men with cirrhosis of the liver and ascites, which fact is cited as significant. The sugar content of the blood increased after subcutaneous injections of 0.7 mg. epinephrin much the same as with alimentary hyperglycemia; the charts of averages of each are practically identical, both in normal persons and in those with signs and symptoms of vagotony or sympathicotony. Only in the four diabetics and the two patients with cirrhosis of the liver, the increase in the blood sugar content seemed to be less regular and to occur later than in the others.

79. **Vaginism.**—Neerman teaches patients with vaginism to combat it by straining as at stool. This brings antagonistic muscles into play and there is little if any further pain. By this means also it is possible to make an examination without the necessity for general anesthesia, which Veit regards as indispensable. In a case described in detail the woman had a right hydronephrosis which possibly may have contributed to the pains.